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EFFERIA COQUILLET IN AMERICA NORTH
OF MEXICO (DIPTERA: ASILIDAE)

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The genus *Efferia* Coquillett (*Erax* of authors, not Scopoli; *Nerax* Hull) is one of the largest genera of robber flies in America north of Mexico and is also abundant in Central and South America and the Caribbean islands. Martin (1965) says that ten species have been reported from other than the Americas and he has verified two of these records: *Efferia salomon* (Macquart) from "Isles Solomon" and *Efferia sinensis* (Macquart) from China.

The Nearctic species were reviewed by Hine (1919) including the species then available from Mexico and the Caribbean islands. Hine (1919) listed 52 species from the United States and Canada. Since 1919 the following species have been described from the Nearctic Region: Bromley (1934), *E. bexarensis* and *E. prairiensis* from Texas, and *E. canellus* from Arizona; Bromley (1937), *E. knowltoni* and *E. utahensis* from Utah, and *E. tanneri* from Colorado; Bromley (1940), *E. vertebratus* from California, *E. benedicti* and *E. subaridus* from Arizona, and *E. wilcoxi* from Texas; Hardy (1943), *E. cuervanus* from New Mexico; Wilcox and Martin (1945), *E. anacapai* and *E. clementei* from California; and Bromley (1951), *E. mesquite* and *E. monki* from Texas, *E. helenae* from Colorado, and *E. tricellus* from Arizona. These species plus those listed by Hine (1919) make a total of 69 species.

Martin and Wilcox (1965) list 70 species from the Nearctic Region. The discrepancy between this and the previous total is that Martin and Wilcox (1965) add *E. macrolabis* (Wiedemann) and *E. mexicana* (Hine) and delete *E. anomala* (Bellardi) which was included by Hine (1919). In this paper four species listed by Martin and Wilcox 1965 are not included, namely, *E. dubia* (Williston), *E. macrolabis* (Wiedemann), *E. mexicana* (Hine) and

E. tanneri (Bromley) but four species have been added, namely, *E. anomala* (Bellardi), *E. completa* (Macquart), *E. prolifica* (Osten Sacken) and *E. similis* (Williston) so that the total of previously described species is still 70. These differences are explained as follows: Martin and Wilcox (1965) list *E. affinis* (Bellardi) and *E. anomala* as not Nearctic, James (1934 and 1941) reported *E. affinis* from Colorado which is apparently a misidentification, Williston (1885), Osten Sacken (1887), and Hine (1919) report *E. anomala* from Arizona and other localities in the southwest and it is retained here because it is a well defined species and no difference between it and the Mexican type has been published; *E. macrolabis* from Kentucky is not known to the writer so is not included, Hine (1919) listed it as a synonym of *E. aestuans*; Bromley (1934) reported *E. mexicana* from Texas based on my misidentification of a small specimen of *E. aestuans*; *E. tanneri* from Colorado is here considered to be a synonym of *E. staminea* (Williston); *E. dubia* from Washington is here considered to be a *nomen nudum*; *E. prolifica*, *E. similis*, and *E. completa* placed in synonymy by Hine (1919) and the latter two by Martin and Wilcox (1965), are here considered to be valid species.

Two important name changes were made of common species by Martin and Wilcox (1965): *E. albibarbis* (Macquart) equals *E. barbatus* of Hine and other authors, not Fabricius, and *E. pogonias* (Wiedemann) equals *E. rufibarbis* (Macquart) of Hine and other authors.

Thirty species are described here as new and unless indicated otherwise in the text, the types will be deposited in the collection of the California Academy of Sciences, San Francisco.

Efferia Coquillett.

Efferia COQUILLET, 1893, Canad. Entomol., vol. 25, p. 175. Type-species, *E. candida*

Coquillett. COQUILLET, 1910, Proc. U. S. Nat. Mus., vol. 37, p. 536.

Nerax HULL, 1962, U. S. Nat. Mus. Bull., vol. 224 (part 2), p. 476.

Erax authors, not Scopoli.

The genus is so variable that it is hard to define. Length of Nearctic species 10–38 mm. Martin (1965) gives a range from 6–40 mm.

Head in anterior view broader than high; face at antennae from two-thirds to subequal to the width of one eye, lower half or more gibbous, usually with oral bristles and long hairs above covering the gibbosity. Frons deeply recessed, usually narrower at vertex than at the antennae; ocellar tubercle small, usually with two or more strong bristles but sometimes with short hairs only; occipital bristles present. Antennae short, segments 1 and 2 cylindrical, 3 oval, 1 and 3 subequal in length and longer than 2, terminal style bristle-like and 1-2 times length of 3.

Mesonotum broad, usually not highly arched or compressed; lateral

and posterior dorsocentral bristles present, anterior dorsocentrals usually absent or hair-like. Anterior hairs usually short but sometimes long, dense, and erect and sometimes bristlelike. Scutellum swollen, with two or more marginal bristles and discal hairs of various length and density.

Abdomen broad basally, slightly narrowing apically, variously covered with pollen and hair, the males frequently with long white parted hair on one or more segments; segment 1 with lateral bristles. Male terminalia large, non-rotate, usually projecting upward at about a 30° angle with the body axis, consisting of segment 8 and the following segments, as long or longer than segments 6-7 together. Female ovipositor heavily chitinized, as long or longer than segments 6-7 together, usually compressed laterally but sometimes cylindrical, and consists of segment 8 and the following segments.

Legs stout, femora moderately to strongly swollen, male hind tibiae sometimes enlarged apically, bristles strong, empodia and pulvilli present.

Wings usually long and narrow, in some males with the costa dilated and thickened and the wings broadened. Anterior branch of the third vein and usually the posterior branch ending in the costa before the apex of the wing. Third vein branched well before, opposite or beyond the end of the discal cell. The basal section of the anterior branch of the third vein in a few species connects with the second vein forming three submarginal cells but in most species this connection is broken leaving a stump vein. As the furcation moves distad the stump vein shortens and in a few species, especially the males, it is absent but the angle is still about 90° .

Probably the gibbous face, deeply recessed frons, large male terminalia and long chitinized female ovipositor, are the most consistent characters for separating *Efferia* from the related genera.

Nerax Hull 1962 was proposed to include all of the species of *Erax* of Hine which have two submarginal cells in the wings, thus restricting *Efferia* Coquillett to the species with three submarginal cells. Williston (1901) and Hine (1919) did not consider *Efferia* Coquillett worthy of separate generic rank from the flies they then included in *Erax* Scopoli of Macquart. Hine (1919) placed the flies with three submarginal cells in his Anomalous Group and this group as now constituted is so varied that a separate name for the remaining species is not warranted. Martin (1961) and (1965) has gone into detail on the status of *Erax*, *Efferia*, and *Nerax*.

THE GROUPS OF *Efferia*

Hine (1919) divided the genus into groups based mainly on the wing venation. The third vein branches before the end of the discal cell (base of the second posterior cell or discal crossvein) in the Staminea Group and usually in the Anomala Group; opposite or near the end of the discal cell in the Arida and Pogonias groups; and beyond the end of the discal cell

in the Aestuans, Albibarbis, Carinata, and Tuberculata groups. The Anomala Group has three submarginal cells while all the other groups have two. In the Aestuans Group the posterior branch of the third vein curves backward at the tip and ends in the costa beyond the apex of the wings; in all other groups it curves forward and ends before the apex. The anterior branch of the third vein in most species ends in the costa but in a few species it usually ends in the second vein, as follows: Anomala Group, *E. azteci*, new species and *E. pernicis* Coquillett; Pogonias Group, *E. pilosa* (Hine); and Staminea Group, *E. coquilletti* (Hine), *E. deserti*, *E. ehrenbergi*, *E. parkeri*, *E. yermo*, and *E. yuma*, new species, and *E. wilcoxi* (Bromley).

Except for the Carinata Group, the other characters for separating the groups are based on one sex only, and while not entirely satisfactory are quite useful. The groups as used by Hine (1919) are retained in this paper. Martin (1965) has proposed three additional groups which are not used here as the number of species involved from the Nearctic Region is too limited. Several species are included in the keys to two groups in order to aid in their identification, they are *E. bryanti*, new species and *E. completa* (Macquart) in the Anomala and Pogonias groups; and *E. pilosa* (Hine) in the Pogonias and Staminea groups.

THE MALE TERMINALIA

Hine (1919) separated the species mainly on the form of the dorsal part of the male hypopygium or genitalia (upper or superior forceps, or surstyli) as these parts are easily seen and less obscured by hairs. The term male terminalia as used here refers to abdominal segment 8 and the following segments; Hine (1919) used the term hypopygium in most cases and male genitalia in a few. The upper forceps, referred to as surstyli in this paper, offer many good characters for the separation of the species. In most species the surstyli in dorsal view are of uniform width, but in a number of species they are wider near the apex than at the base; in lateral view they may be of uniform width, or broader or narrower at the apex than at the base; the apical margin may be rounded, angular or truncate and frequently has projections of various sizes and shapes referred to here as lobes or flanges; and the color of the integument plus the color, length and density of the hairs, are useful in separating the species. The proctiger extends up between the surstyli at two-thirds or three-fourths their length and is shown in the figures.

The lower forceps are also of considerable value in placing the species and have been more or less ignored by previous authors. It is necessary to relax most specimens before the lower forceps can be separated from the upper forceps and their structure revealed. They are excised at or near the middle dorsally, usually with a dorsal tooth or projection which varies in size and shape, the portion beyond the middle is usually long and slender but can

be short and here is referred to as the tail. The ventral fringe of hairs ("mane" of Bromley, 1937) varies in color, length, and density and is very useful in the separation of the species. The lower forceps also enclose the penis sheaths which in turn enclose the aedeagus; these structures frequently extend beyond the lower forceps and are easily seen but are not utilized or figured here.

The apical abdominal segments have been included in the figures. Sternite 9 (the hypandrium) is not very conspicuous in most species. In most species the ventral portion is rounded and polished and in most pinned specimens is hidden by sternite 8; it apparently serves as a bearing for the movement of the lower forceps. In a few species it is visible in pinned specimens; in about 100 specimens of *E. latruncula* (Williston) examined, the polished lobes were visible in every one. The hypandrium of *E. interrupta* (Macquart) is unique in that it is projected apically, is hairy and pollinose, and is similar in structure to sternite 8. The upper part of the hypandrium is visible in most specimens; it is a small rounded or triangular lobe posterior to the lower corner of tergite 8, is usually pollinose and bears a few hairs.

Segment 8 is usually plainly visible but may be hidden or telescoped by segment 7 in a few specimens. Tergite 8 laterally is pollinose and bears a few hairs, the dorsal part is thinly chitinized and without hairs or pollen apparently because of the movement of the surstyli. In most species sternite 8 is narrow and much shorter than sternite 7; it is pollinose and frequently bears long hairs on its apical margin. In a number of species sternite 8 is projected apically and varies from subequal in length to sternite 7 to nearly two times as long; it may be narrow or broad apically and usually has long apical hairs. Species in the several groups which have sternite 8 projected are: Aestuans Group, *E. aestuans* (Linnaeus); Staminea Group, *E. argenti-frons* (Hine), *E. argyrosoma* (Hine), *E. basini*, new species, *E. benedicti* (Bromley), *E. californica* (Schaeffer), *E. canella* (Bromley); *E. pallidula* (Hine), and *E. texana* (Banks); Tuberculata Group, *E. tuberculata* (Coquillett).

THE OVIPOSITOR

The ovipositor of *Efferia* is heavily chitinized, as long or longer than abdominal segments 6-7, and consists of segment 8 and the following segments. In most species and groups it is strongly compressed or flattened laterally, but in the Pogonias Group, in *E. albibarbis* (Macquart) (Albibarbis Group), and *E. interrupta* (Macquart) (Staminea Group), it is more or less cylindrical. Segment 8 is two or more times the length of the remaining segments and varies in length, width and form. Segment 9 usually tapers apically and the tergite is more heavily chitinized than the sternite which bears the gonophore. At the base of sternite 9 there is a heavily chitinized spot which was thought

to be the gonophore, however a specimen was found with the egg protruding and the entire sternite 9 beyond the chitinized spot opens for the emission of the egg. The cerci (end lamellae of Hine, 1919; segments 10 and 11, Crampton, 1942) are usually rounded or oval lobes more or less covering the proctiger, but in the Pogonias Group they are pointed apically and split dorsoventrally.

The ovipositor offers fewer characters for the separation of the species than the male terminalia and has been generally ignored in descriptions. It is very useful for the separation of a number of species and has been figured when available. The females are more difficult to determine than the males and separate keys have been prepared for them which with the figures should facilitate the identification of this sex.

Lavigne (1964) has observed *Efferia bicaudata* (Hine) ovipositing in sandy soil and gives other interesting data on the prey and habits of this species.

FIGURES AND DISTRIBUTION RECORDS

Figures of the male terminalia and wings were drawn to reproduce at about 7.5 times normal size and of the female ovipositor at about 15 times. Measurements of the face, eyes, vertex, and antennae were made with an ocular micrometer at about 30 times, and of the wings at about 15 times.

Hine (1919) and in his earlier papers usually listed the specimens by states and rarely gave definite localities or collecting dates. As many of the species are quite seasonal and restricted in their habitat, definite collecting records are given for most species. Others which are more common or widely distributed are listed only by general localities and by the months of their occurrence.

ACKNOWLEDGMENTS

I am indebted to the following persons and institutions for the loan of specimens. Abbreviation symbols are given for each institution.

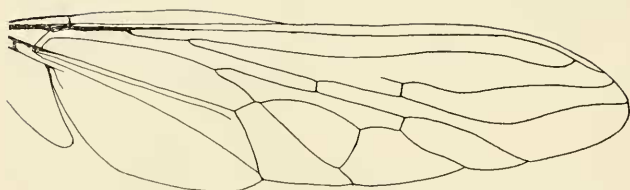
J. G. Rozen, Jr., American Museum of Natural History.....	AMNH
Mont A. Cazier, Arizona State University, Tempe.....	ASU
Paul H. Arnaud, Jr., California Academy of Sciences.....	CAS
D. J. Burdick, California State College, Fresno	CSCF
E. L. Sleeper and Eric Fisher, California State College, Long Beach	CSCLB
J. A. Powell and Frank R. Cole, California Insect Survey, University of California, Berkeley.....	CIS
Lloyd Martin, Los Angeles County Museum	LACM
R. M. Bohart and A. T. McClay, University of California, Davis	UCD
E. I. Schlinger and P. H. Timberlake, University of California, Riverside.....	UCR

Many other persons have supplied me with specimens either by gift, exchange, purchase, or duplicates retained for identifications and have helped me in other ways. First should be mentioned James S. Hine who determined a number of specimens for me from 1927 to 1931; Stanley W. Bromley who compared specimens for me with the Hine types in 1935; and Charles T. Greene who compared specimens for me with the Coquillett types in 1937. Most of the material from Texas and the states north and east of there was supplied by Raymond H. Beamer, Stanley W. Bromley, A. Earl Pritchard, and H. J. Reinhard.

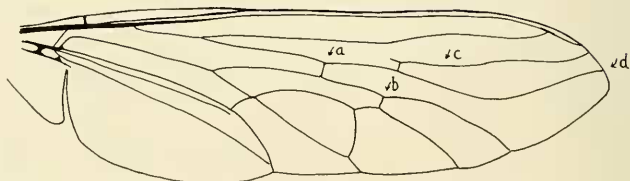
The following persons have collected specimens for me or given me specimens as individuals rather than representatives of an institution: L. D. Anderson, Riverside, California; N. R. Anderson, Alhambra, California; Paul H. Arnaud, Jr., San Francisco, California; Wm. W. Baker, Friday Harbor, Washington; F. S. Blanton, Gainesville, Florida; Marston Bates, Ann Arbor, Michigan; A. E. Bonn, Seattle, Washington; Bernard Brookman, Bethesda, Maryland; Owen Bryant, Tucson, Arizona; Sidney Camras, Chicago, Illinois; F. S. Carr, Medicine Hat, Alberta; W. R. Cobb, Whittier, California; K. W. Cooper, Princeton, New Jersey; S. E. Crumb, Puyallup, Washington; Earl G. Davis, Tucson, Arizona; C. C. Deonier, Harrah, Oklahoma; D. K. Duncan, Globe, Arizona; Paul M. Eide, Mt. Vernon, Washington; George P. Engelhardt, Hartsdale, New York; Eric Fisher, Los Angeles, California; R. A. Flock, Riverside, California; D. K. Frewing, Corvallis, Oregon; David G. Hall, Washington, D.C.; C. W. Getzendaner, Forest Grove, Oregon; A. F. Howland, Riverside, California; M. T. James, Pullman, Washington; R. T. Kellogg, Silver City, New Mexico; Carl W. Kirkwood, Summerland, California; M. C. Lane, Tacoma, Washington; Hugh B. Leech, San Francisco, California; Charles H. Martin, Corvallis, Oregon; A. L. Melander, Riverside, California; Martin A. Mortenson, Tempe, Arizona; Frank H. Parker, Globe, Arizona; H. B. Parks, San Antonio, Texas; Art Raske, Berkeley, California; H. A. Scullen, Corvallis, Oregon; Marshall W. Stone, Riverside, California; Guy F. Toland, Monrovia, California; Pat Vail, Riverside, California. To the others who have probably been overlooked, many thanks, and I hope they will find their names in the text in connection with the specimens they collected. The initial symbols (without periods) of these and other collectors are used in the text.

OTHER ABBREVIATION SYMBOLS USED IN THE TEXT

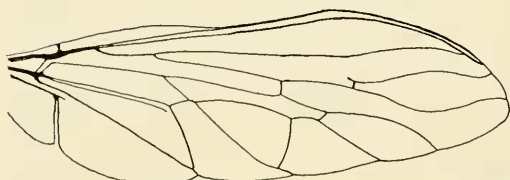
Academy of Natural Sciences, Philadelphia.....	ANSP
British Museum of Natural History.....	BMNH
Boston Society of Natural History.....	BSNH
Brigham Young University, Provo	BYU
Joseph Wilcox.....	JW



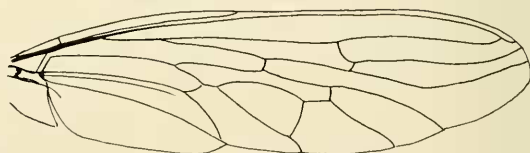
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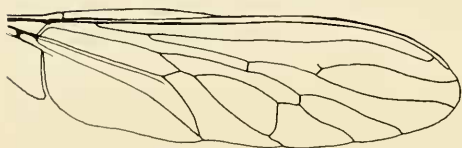
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3. PERALTA



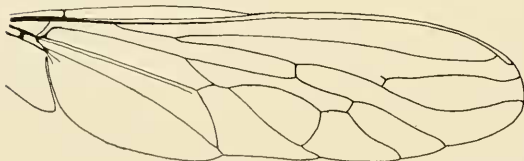
4. ANTIOCHI



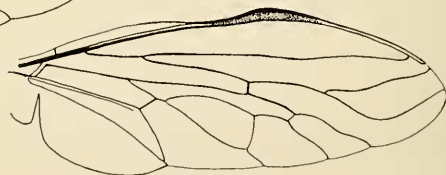
5. BEAMERI



6. COQUILLETTI



7. SETIGERA



8. CALIENTE

Museum of Comparative Zoology.....	MCZ
Ohio State University.....	OSU
Texas Agricultural and Mechanical University.....	TAMU
University of Kansas.....	UK
University of Michigan.....	UM
United States National Museum.....	USNM
Utah State University, Logan.....	USU
University of Texas.....	UT

KEY TO THE GROUPS

1. Three submarginal cells in the wings Anomala Group
Two submarginal cells 2
2. The third vein of the wings forks before the discal crossvein (end of discal cell or base of second posterior cell) 3
Third vein forks opposite or beyond the discal crossvein 4
3. Mesonotum anteriorly with bristles or bristle-like hairs as long or longer than antennal segments 1-2; male abdominal repeats 2-5, usually blackish basally without parted hairs, segments 6-7 white pollinose; ovipositor pointed and split at tip - Pogonias Group
Mesonotum anteriorly usually with short hairs, if longer not bristle-like; male abdomen usually grayish pollinose and frequently with long parted hairs; ovipositor rounded at tip, not split Staminea Group
4. Posterior branch of the third vein curves backward at the tip and meets the costa beyond the apex of the wing Aestuans Group
Posterior branch of the third vein curves forward and meets the costa well before the apex of the wing 5
5. Mesonotum compressed laterally and on the mid-dorsal line with a narrow crest of long hairs or bristles Carinata Group
Mesonotum not compressed laterally, hairs anteriorly usually short but if long covering the dorsocentral as well as the central row 6
6. Mesonotum anteriorly with numerous erect hairs as long as antennal segments 1-3; scutellum usually with numerous marginal bristles; tarsal bristles usually white Arida Group
Mesonotum anteriorly usually with hairs shorter than antennal segments 1-2; scutellum usually with not more than 6 marginal bristles; bristles of the tarsi usually black 7

←

FIGURES 1-8. Wings of the various groups of *Efferia*:

1. Pogonias Group, *E. mortensoni*, new species.
2. Arida Group, *E. apache*, new species; a, anterior crossvein; b, discal crossvein; c, anterior branch of the third vein; d, posterior branch of the third vein.
3. Albibarbis Group, *E. peralta*, new species.
4. Anomala Group, *E. antiochi*, new species.
5. Aestuans Group, *E. beameri*, new species.
6. Staminea Group, *E. coquillettei* (Hine).
7. Tuberculata Group, *E. setigera*, new species.
8. Carinata Group, *E. caliente*, new species.

7. Male abdomen ventrally with prominent tubercles on segments 4-6; rather small slender species Tuberculata Group
 Male abdomen without ventral tubercles; rather small to large species, the small species frequently with short stout bristles in the upper part of the mystax Albibarbis Group

AESTUANS GROUP

Hine (1919) says, "The species falling in the group are recognized at once by the peculiar posterior branch of the third vein which, instead of curving forward at its apex, as in the other groups, curves backward and reaches the costa near or beyond the apex of the wing. The branching of the third vein occurs beyond the base of the second posterior cell."

In the Nearctic Region the species occur mainly in the southern and eastern states, ranging as far west as Wyoming, Colorado, and New Mexico. The group is more numerous in the Neotropical Region and Hine (1919) includes several species from Mexico and gives a separate key and descriptions of seven species from the West Indies. Bromley (1929) described three new species from Cuba and gave a key to the species.

Material available in this group is quite limited, *E. slossonae* (Hine) has not been seen and *E. belfragci* (Hine), and *E. femorata* (Macquart) are represented by one sex only. James (1934) reported *E. affinis* (Macquart) from Colorado but according to Martin and Wilcox (1965), this species is not Nearctic. Bromley (1934) reported *E. mexicana* (Hine) from Texas apparently based on my questioned determination; it is a small specimen of *E. aestuans* (Linnaeus).

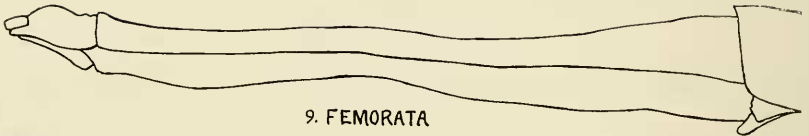
KEY TO THE SPECIES OF THE AESTUANS GROUP—MALES

1. Legs entirely shining black; wings hyaline, costa not dilated; abdominal segments 5-7 silvery pollinose; terminalia black with black hairs, surstyli with a broad apical flange; length 14 mm. (Florida) *E. slossonae* (Hine)
 At least the tibiae distinctly reddish 2
2. Apical half of abdominal segment 2 and 3-7 largely white pollinose with white parted hairs; costa not dilated; length 12-16 mm. (Texas) *E. beameri* new species
 At most abdominal segments 4-7 largely white pollinose and without white parted hairs on any segments 3
3. Costa more or less dilated, subcostal cell light to dark brown; venter of abdomen with fine erect white hairs 4
 Costa not dilated, subcostal cell hyaline; venter of abdominal segments 3-5 or 6 with clumps of short black hairs 8
4. Six or more marginal scutellar bristles; abdominal segments 5-7 silvery pollinose 5
 Normally 2 scutellar bristles; at most abdominal segments 6-7 silvery pollinose 6
5. Mesonotum anteriorly with very short black hair; terminalia black with black hair; length 26-30 mm. (Florida, Georgia, Louisiana) *E. femorata* (Macquart)
 Anterior mesonotal hairs as long or longer than antennal segment 1; terminalia black with black hair, sternite 8 produced; length usually 18-22 mm. but ranges from 14-28 mm. (Colorado, New Mexico, Wyoming and East) *E. aestuans* (Linnaeus)

6. Abdominal segments 6-7 silvery, 6 sometimes with a narrow brown spot basally, 2-5 black dorsally; length 14-22 mm. (Alabama, Georgia, Louisiana, Mississippi, North Carolina, Texas) *E. apicalis* (Wiedemann)
 Abdominal segment 7 only, wholly silvery, 2-6 largely brown or black dorsally 7
7. Sides and usually posterior margin of abdominal segment 6 white pollinose, dorsum of 2-6 black with mostly short black hairs; terminalia black with black hairs, surstyli at apex with tuft of short black hairs, fringe on lower forceps of uniform width and as long as antennal segment 1; length 15-23 mm. (Florida, Georgia)
 *E. tabescens* (Banks)
 Sides of abdominal segments 2-6 grayish pollinose, dorsum brown with mostly short white hairs; terminalia brown, in part white haired, fringe longer at base than apex and margined with white hairs; length 15-19 mm. (Kansas, Oklahoma, Texas)
 *E. kansensis* (Hine)
8. Mystax yellowish; lower forceps with a dense fringe of brownish hairs, longer than antennal segments 1-3; length 13-15 mm. (Kansas) *E. aurimystacea* (Hine)
 Mystax black with a few white hairs intermixed; lower forceps with a sparse fringe of brown and black hairs subequal in length to antennal segments 1-2; length 10-14 mm. (Texas) *E. belfragei* (Hine)

KEY TO THE SPECIES OF THE AESTUANS GROUP—FEMALES

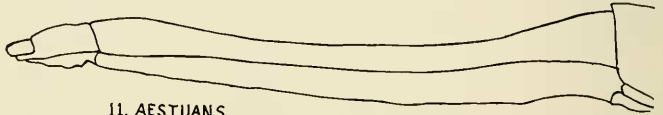
1. Ovipositor 6 mm. long or longer 2
 Ovipositor at most 5.5 mm. long, usually shorter 4
2. Mystax black, some white hairs intermixed; tibiae largely reddish; abdomen gray pollinose, dorsum 2-4 black; ovipositor as long as abdominal segment 4-7; length 10 mm. *E. belfragei*
 Larger species, 14-30 mm. in length 3
3. Hairs anteriorly on the mesonotum shorter than antennal segment 2; tibiae and tarsi dark reddish; ovipositor 7.3 mm. long *E. femorata*
 Hairs anteriorly on the mesonotum as long as antennal segment 1; tips of the tibiae and the tarsi black; ovipositor 6.0 mm. long *E. aestuans*
4. Mystax yellowish with at most 8 black bristles above; ovipositor broad, 2.7 mm. long *E. aurimystacea*
 Mystax white with 15 or more black bristles above; ovipositor at least 3.7 mm. long 5
5. Anterior mesonotal hairs as long or longer than antennal segment 1; ovipositor 4.0 mm. or less in length 6
 Anterior mesonotal hairs shorter than antennal segment 1; ovipositor 4.1 mm. long or longer; abdominal segments 2-5 or 6 black with mostly short black hairs, sides and posterior margins gray pollinose 7
6. Abdominal segments 2-5 gray pollinose and mostly short white haired; ovipositor 4.0 mm. long *E. kansensis*
 Abdominal segments 2-5 black dorsally, 3 with a few and 4-5 mostly short black haired; ovipositor 3.7 mm. long *E. beameri*
7. Ovipositor gradually narrowing apically, 4.1-5.5 mm. long; narrow dorsum and posterior margin of abdominal segment 7 brownish pollinose *E. tabescens*
 Ovipositor narrowed beyond basal 1/3, 4.1-4.5 mm. long; abdominal segment 7 shining black *E. apicalis*



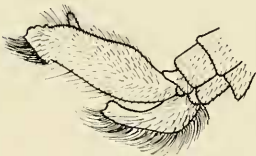
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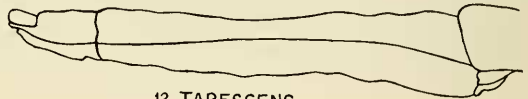
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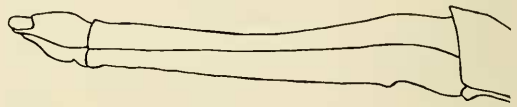
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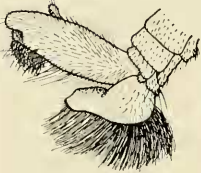
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12. TABESCENS



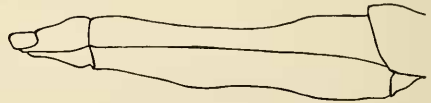
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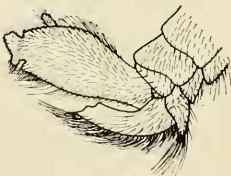
15. AURIMYSTACEA



16. KANSSENSIS



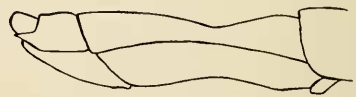
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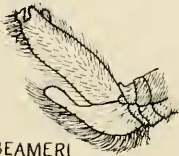
18. AESTUANS



19. APICALIS



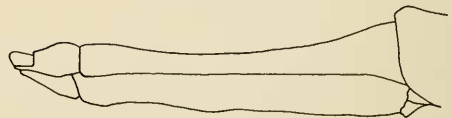
20. AURIMYSTACEA



21. BEAMERI



22. SLOSSONAE



23. BEAMERI

Efferia aestuans (Linnaeus).

Asilus aestuans LINNAEUS, 1763, Systema Naturae, 11th Edition, p. 413. Type, Pennsylvania.
Erax aestuans, HINE, 1919, Ann. Entomol. Soc. Amer., vol. 12, p. 124.

DESCRIPTION, figures of male genitalia and wing, widely distributed over northeastern North America ranging to Florida, New Mexico, and Wyoming. A very abundant species over most of its range.

SYNONYMS: *E. niger* (Wiedemann); *E. bastardi* (Macquart); *E. incisuralis* (Macquart); and *E. tibialis* (Macquart).

Bromley (1934) says, "This widely distributed species is very common in eastern Texas. Frequently alights on buildings, as well as on trees, thickets, posts, and fences; often feeds on house flies. *E. aestuans* has the peculiar habit of alighting on moving objects, such as cattle or even human beings. It is therefore one of the most familiar and readily recognized species." Reports from Texas: Bexar, Brazos, Brown, Burleson, Frio, Kleberg, Madison, Milan, Tarrant, Travis, and Wilson counties, May 2–October 10.

James (1941) records this species from Colorado.

Specimens on hand from Alabama, Arkansas, Florida, Georgia, Kansas, Illinois, Maryland, Massachusetts, Michigan, Mississippi, Missouri, New Jersey, New York, Ohio, Oklahoma, Pennsylvania, South Carolina, Tennessee, Texas, Virginia, and Wisconsin.

It is the only species of the group which has male sternite 8 produced and longer than sternite 7. Males of *E. femorata* have not been seen by me and they are described as similar to *E. aestuans* but larger. Hine's (1919) figure of *E. mexicana* from Mexico indicates it may have sternite 8 produced.

←

FIGURES 9–23. *Aestuans* Group, lateral views of the male terminalia and ovipositors of the *Efferia* species:

9. *E. femorata* (Macquart), ovipositor.
10. *E. belfragei* (Hine), male terminalia.
11. *E. aestuans* (Linnaeus), ovipositor.
12. *E. tabescens* (Banks), ovipositor.
13. *E. tabescens* (Banks), male terminalia.
14. *E. apicalis* (Wiedemann), ovipositor.
15. *E. aurimystacea* (Hine), male terminalia.
16. *E. kansensis* (Hine), male terminalia.
17. *E. kansensis* (Hine), ovipositor.
18. *E. aestuans* (Linnaeus), male terminalia.
19. *E. apicalis* (Wiedemann), male terminalia.
20. *E. aurimystacea* (Hine), ovipositor.
21. *E. beameri*, new species, male terminalia.
22. *E. slossonae* (Hine), male terminalia, redrawn from Hine, 1919.
23. *E. beameri*, new species, ovipositor.

MALE. Length 19 mm. Mystax black with many white hairs below; face at antennae 40/43 width of one eye, vertex 35. Antennal hairs black, segments measure 14-6-15-28.

Mesonotal hairs anteriorly subequal in length to antennal segment 1. Six marginal scutellar bristles, 4 black, 2 whitish; discal hairs mostly yellowish, as long as antennal segments 1-2.

Sides of abdominal segments 2-4, posterior margin of 4, and all of 5-7 white pollinose; hairs on 1-4 yellowish, some black dorsally on 3-4, short white on 5-7; venter grayish pollinose, hairs fine erect white. Segment 8 black, tergite with black hairs, sternite longer than 7 with a dense clump of long black hairs apically and a few short white basally. Terminalia black with black hairs, a few white above apically on surstyli; fringe brownish black subequal in length to antennal segment 1. Wings hyaline, veins brown, anterior crossvein at 40/60 length of discal cell, stump vein short, costa slightly dilated, subcostal cell brown.

FEMALE. Length 21 mm. Black hairs in mystax stouter, bristlelike. Sides and posterior margins of abdominal segments 2-6 grayish pollinose and posterior margin of 7, dorsum brownish pollinose but appearing black; hairs yellowish white, longer on sides of 1-3, dorsum short black haired, 7 wholly; venter gray pollinose with erect white hairs, a few black on 7. Ovipositor 5.9 mm. long, at middle 1/10 as long as broad.

The ovipositor is frequently distorted and in smaller specimens measures only 5 mm. long while in larger specimens it is 6.8 mm. long. In a series of 8 males and 20 females sent to me by and collected by K. W. Cooper from Brown Mills, New Jersey, 11 July 1933, and Princeton, New Jersey, 30 June, 7, 27 July 1940, 12 Aug. 1941, two of the males have abdominal segments 5-8 wholly white pollinose and 7 of the females have the ovipositor short, varying from 3.2 to 4.4 mm. long.

Efferia apicalis (Wiedemann).

Asilus apicalis WIEDEMANN, 1821, *Diptera Exotica*. Kiliae. Vol. 1, p. 191. Type, North America.
Erax apicalis, HINE, 1919, *Ann. Entomol. Soc. Amer.*, vol. 12, p. 125.

DESCRIPTION and figure of male genitalia; reported from *Georgia*: Decatur County (Bradley); *North Carolina*: Southern Pines (Manee).

SYNONYM. *E. vicinus* (Macquart).

Bromley (1934) says, "A small species suggesting a miniature *E. acstuns*. Occurs in sandy fields, alighting on the short, scattered weed stalks. August."

Fattig (1945) reports it from *Georgia*: Albany, June; Billys Island, Okefenokee Swamp, June; Dellwood, July (W. C. Stehr); Ludowici, September; Lyons, July (W. C. Stehr); Roberta, June; Spring Creek, Decatur County, June, July; Stone Mountain, July; Vidalia, August; Waycross, May; Wrens, August 22, 1930 (R. H. Beamer).

Bromley (1950) reports it from *Florida*: Daytona; Gainesville, 7-7-18 (JRW), 8-26-17 (H. L. Dozier), 8 miles NW., 9-21-38 (EST); Plymouth, August 11, 1920 (W. W. Yothers).

Specimens from the following localities. *Alabama*: Batesburg, 24 August 1930 (R. H. Beamer, P. W. Oman, L. D. Tuthill). *Georgia*: Wrens, 28 August 1930 (R. H. Beamer, P. W. Oman). *Louisiana*: Beauregard County, 16 August 1928 (A. M. James). *Mississippi*: Hamilton, 15 July 1930 (R. H. Beamer).

MALE. Length 17 mm. Mystax black, lower half mostly white; face at antennae 36/47 width of one eye, vertex 26. Antennae black haired, segments measure 15-5-16-30.

Anterior mesonotal hairs 2/3 length of antennal segment 1. Two black marginal scutellar bristles plus 3 black hairs, discal hairs yellowish and as long as antennal segments 1-2.

Sides of abdominal segments 2-5 yellowish pollinose, 6-7 white, dorsum 2-5 brown pollinose appearing black, hairs yellowish, longer on 1-2, dorsum 3-5 short black, 6-7 short white; venter 1-5 grayish, 6-7 white pollinose, 3-5 narrowly bare at middle, hairs yellowish, longer on 1-3, white on 6-7 with a few black on the bulge on 6. Tergite 8 black with a few black hairs, sternite gray with a few long white and black hairs apically. Terminalia black with black hairs, a few yellowish on surstyli at apex above; fringe black and dense, as long as antennal segment 1.

Wings hyaline, light brownish apically, veins brown, anterior crossvein at 32/52 length of discal cell, very short stump vein, costa slightly dilated, subcostal cell brown.

FEMALE. Length 17 mm. Scutellar hairs all yellowish, subequal in length to antennal segment 1. Sides and posterior margins of abdominal segments 2-6 grayish pollinose, 7 black; sides of 1-5 with yellowish hairs, dorsum of 2-5 and 6-7 all short black haired; venter gray, 4-7 narrowly bare at middle, hairs yellowish becoming shorter apically, a few black hairs at apex of 7. Ovipositor black, 4.4 mm. long, at middle 1/10 as wide as long.

***Efferia aurimystacea* (Hine).**

Erax aurimystaceus HINE, 1919, Ann. Entomol. Soc. Amer., vol. 12, p. 122.

TYPES, male and female. Clark County, Kansas (F. H. Snow) OSU; also Ellis, Grove and Ness counties, Kansas, mostly taken in July. Figure of male genitalia.

Specimens from the following localities. *Kansas*: Cheyenne County, 3 July 1925 (Howard Deay); Kiowa County, 4 July 1923 (W. B. Whitlow); Norton County, 5 July 1925 (R. H. Beamer, N. J. Grady).

MALE. Length 14 mm. Mystax yellowish; face at antennae 33/38 width of one eye, vertex 24. Hair below on antennal segment 1 yellow, above black and yellow, on 2 black; segments measure 11-7-16-21.

Anterior mesonotal hairs subequal in length to antennal segment 1. Scutellum yellowish pollinose with erect yellowish hairs as long as antennal segments 1-2, 2 black marginal bristles.

Abdomen black, dorsum 2-5 brown pollinose, sides and 6-7 grayish white pollinose; hairs yellowish white, longer on sides of 1-2, a few short black dorsally on 2-5; venter gray pollinose, hairs erect yellowish on 1-3, posterior margins of 3-7 swollen and with coarse black hairs, 7-8 posteriorly with coarse yellowish and a few black hairs. Terminalia dark brown; hairs on surstyli black, at apex ventrally with clump of dense crinkly yellowish hairs; hairs on lower forceps black basally, yellowish apically, fringe brown basally and yellowish apically, dense and as long as antennal segments 1-3.

Wings hyaline, veins brown, anterior crossvein at $22/37$ length of discal cell, third vein with long stump vein, costa not dilated.

FEMALE. Length 15 mm. As many as 8 black bristles above in mystax. Antennal hairs mostly black. Scutellar bristles yellowish. Abdominal segments 2-7 brown dorsally with short black hairs, gray laterally with yellowish hairs on 2-6; venter gray, erect yellowish haired with some black on posterior margins 5-7. Ovipositor black, 2.6 mm. long, at middle about $1/3$ as broad as long.

Efferia beameri Wilcox, new species.

MALE. Length 12 mm. Head black, grayish white pollinose, gibbosity and frons subshining. Mystax black with finer white hairs intermixed; face at antennae $28/38$ width of one eye, vertex 22; hairs on frons, 2 bristles on ocellar tubercle, upper occipitals and hairs on palpi mostly, black; beard, hairs on proboscis and upper occiput, white. Antennae black, hairs black, segments measure 11-5-12-22.

Mesonotum black, grayish pollinose, central stripe broad black, intermediate spots brown appearing black. Anterior hairs as long as antennal segment 1, black; on humeri and margins white. Bristles black, 2 presutural, 2 supraalar, 2 postalar, 4-5 posterior dorsocentral. Pleura and coxae gray pollinose, hairs white, a few on mesopleura and hypopleurals black. Scutellum gray pollinose, hairs erect white and as long as antennal segments 1-2, 3 black and 1 white marginal bristles.

Abdomen black, segments 1-3 grayish white, 4-7 white pollinose; basal half of 2 and narrow basal margins of 3-4 black; hairs long white, parted on 2-7 becoming shorter apically. Venter grayish white pollinose, hairs erect white on 1-4, shorter on 5-7, 7 with longer hairs on apical margin. Segment 8 black, hairs yellowish with a few black. Terminalia brown; surstyli black haired, a few yellowish above at apex and a tuft of crinkly yellowish hairs below at apex; hairs on lower forceps black, fringe white basally becoming brown apically, subequal in length to antennal segment 1.

Femora black, tibiae yellowish red, tips and tarsi brown. Hairs on femora black, below and on posterior side white; black and white on fore and middle tibiae, black and yellowish on hind tibiae; tarsi mostly black. Bristles black: claws black, base reddish; empodia and pulvilli brownish.

Halteres light brown. Wings hyaline, veins brown, anterior crossvein at 22/36 length of discal cell, stump vein as long as anterior crossvein, costa not dilated.

FEMALE. Length 16 mm. Two black and 2 weaker white marginal scutellar bristles. Sides and posterior margins of abdominal segments 2-6 grayish pollinose; dorsum 2-5 brownish pollinose, 6-7 shining black; hairs yellowish white, longer on 1-2, a few short black dorsally on 3, 4-7 largely black haired dorsally; venter grayish pollinose, broad black at middle of 3-7, hairs erect white, shorter on 7 with black hairs apically. Ovipositor black, 3.7 mm. long, at middle 1/6 as wide as long. Wings brownish apically, stump vein short.

HOLOTYPE. Male, Concan, Texas, 6 July 1936 (J. D. Beamer), UK.

ALLOTYPE. Female, same data (D. R. Lindsay), UK.

Named in honor of the late R. H. Beamer and family who contributed much to our knowledge of the Asilidae of America. These specimens were included in material submitted for identification years ago and are returned to the University of Kansas.

Efferia belfragei (Hine).

Erax belfragei HINE, 1919, Ann. Entomol. Soc. Amer., vol. 12, p. 121, fig. of ♂ genitalia.

TYPES, male and female, Texas (Belfrage), USNM.

Bromley (1934) reports this species from Texas: Austin, May 15, 1931 (UT); Milano, April 28, 1929.

A male specimen was taken from the following locality. Texas: Uvalde, 1 May 1936.

MALE. Length 13 mm. Face 32/37 width of one eye, vertex 26. Antennae black, hairs black, segments measure 10-6-12-22.

Anterior mesonotal hairs black, as long as antennal segments 1-2. Scutellum with 5 black marginal bristles, erect hairs white and as long as antennal segments 1-2.

Abdomen black, sides of 2-5 brownish, 6-7 grayish pollinose; hairs yellowish, long on sides of 1-3, 1-4 with black marginal bristles; venter 1-3 with erect white hairs, 3-5 posteriorly with short black hairs. Terminalia brown, hairs black, surstyli apically above with yellowish hairs and below apically with dense yellowish crinkly hairs; fringe on lower forceps sparse brown, subequal in length to antennal segment 1, plus margin of sparse longer black hairs.

Wings hyaline, veins brown, anterior crossvein at 25/40 length of discal cell, third vein with short stump vein, costa not dilated, subcostal cell hyaline.

***Efferia femorata* (Macquart).**

Erax femoratus MACQUART, 1838, *Dipteres exotiques nouveaux ou peu connus*. Paris. Vol. 1, no. 2, p. 115. Type, Carolina.

Erax femoratus, HINE, 1919, *Ann. Entomol. Soc. Amer.*, vol. 12, p. 123.

DESCRIPTION. Records from Slidell, Louisiana (Hine) from trunks of trees, and from Florida.

Fattig (1945) gives the following records from *Georgia*: Atlanta, July; Jekyll Island, September (S. W. Bromley); Macon, July; Okefenokee Swamp, July 25, 1939 (J. D. Beamer); Stone Mountain, July; Thompson, August; Vidalia, July.

Bromley (1950) lists the following records from *Florida*: Bratt, June-August (FSB); Clearwater, April (Van Duzee); Coconut Grove, 3-31-28; Crescent City; Duval, '44 (WEG); Lake City (JRW); Lake Worth, 3-23-35 (SWB); St. Augustine (CWJ). He says, "The largest *Erax* east of the Mississippi. Alights on tree trunks or fences. When disturbed it may fly around a tree trunk alighting a few feet further up on the opposite side of the same tree. (Fig. 9)." Figure is photograph of female.

Two female specimens are reported from *Georgia*: Okefenokee Swamp, 30 July, 3 August 1934 (R. H. Beamer).

FEMALE. Length 28 mm. Mystax composed of black bristles with a few yellowish white hairs; face at antennae 49/60 width of one eye, vertex 38. Antennae black, hairs yellowish below, black above, segments measure 16-9-21-36.

Anterior mesonotal hairs black, shorter than antennal segment 2. Scutellar hairs black, a few white, as long as antennal segment 2, 7 black and 1 white marginal bristles.

Sides and posterior margins of abdominal segments 2-6 grayish pollinose, dorsum 2-7 brownish pollinose, 7 shining black laterally; hairs yellowish white on 1-5, longer on 1-2, black dorsally, 6-7 all black haired; venter 1-6 grayish pollinose, 7 black with black hairs, hairs on 1-5 erect yellowish, shorter on 6. Ovipositor 7.3 mm. long, at middle 1/12 as wide as long.

Wings hyaline basally, light brown apically, veins brown, anterior cross-vein at 51/75 length of discal cell, stump vein longer than anterior crossvein, costa slightly dilated, subcostal cell light brown.

***Efferia kansensis* (Hine).**

Erax kansensis HINE, 1919, *Ann. Entomol. Soc. Amer.*, vol. 12, p. 122, fig. of male genitalia.

TYPES, male and female. Clark County, Kansas, 1962 (F. H. Snow), OSU.

Bromley (1934) reports the following records from *Texas*: Austin, May (UT), June-July (RHP); De Leon, June 28, 1931.

James (1941) reports the following from *Kansas*: Coolidge, July 31, 1933 (Rodeck and James), less than one mile from the Colorado line.

Specimens are known from the following localities. *Kansas*: Ellsworth County, 13 July 1923 (R. H. Beamer); Wichita, 3 July 1949 (B. L. and J. G. Rozen). *Oklahoma*: Beaver County, 28 July 1933 (A. E. Pritchard); Alfalfa County, 11 August 1932 (A. E. Pritchard). *Texas*: Aransas County, 6 August 1928 (L. D. and R. H. Beamer).

MALE. Length 15 mm. Mystax yellowish white with about 8 black bristles above; face 34/40 width of one eye, vertex 24. Antennae with yellowish and black hair on segment 1, black on 2, segments measure 11-6-16-24.

Anterior mesonotal hairs as long as antennal segment 1. Scutellum gray pollinose, erect hairs as long as antennal segments 1-2 and 2 marginal bristles, yellowish white.

Abdomen brown, dorsum of 2-6 light brown pollinose, sides and segment 7 all gray pollinose, hairs short white, longer on sides of 1-3. Venter gray pollinose with bare spots at middle of 3-5; hairs erect white on 1-3, short on 4-5, 6-7 swollen with clumps of coarse white hairs. Terminalia brown; hairs on surstyli black, at apex above and on ventral margin mostly yellowish; hairs on lower forceps white, fringe yellowish, basally as long as antennal segments 1-2, gradually shortening apically so at apex as long as antennal segment 1.

Wings hyaline, apex anteriorly light brown, veins light brown, anterior crossvein at 25/40 length of discal cell, stump vein short, costa slightly dilated, subcostal cell light brown.

FEMALE. Length 17 mm. Mystax with about 18 black bristles above. One black and 1 white scutellar bristle. Sides and posterior margins of abdominal segments 2-6 grayish pollinose, 2-5 light brown dorsally, 6 largely and 7 all black; hairs yellowish, longer on 1-2, a few black on 4-5 and 6-7 largely black haired. Venter gray pollinose, 3-7 broadly bare at middle, hairs yellowish becoming shorter apically. Ovipositor black, 3.5 mm. long, at middle $1/6$ as wide as long.

Efferia slossonae (Hine).

Erax slossonae HINE, 1919, Ann. Entomol. Soc. Amer., vol. 12, p. 121, fig. of male genitalia.

TYPE, male, Jacksonville, Florida (Mrs. Anna T. Slosson), BSNH.

Apparently only known from the male type.

Efferia tabescens (Banks).

Erax tabescens BANKS (in Hine), 1919, Ann. Entomol. Soc. Amer., vol. 12, p. 126, figures of male genitalia.

TYPE, male, Florida, MCZ.

Fattig (1945) records this from *Georgia*: Augusta, August.

Bromley (1950) records this species from the following localities in *Florida*: Branford, 4 August 1939 (R. H. Beamer, D. E. Hardy); De Land, 28 August 1939 (E. G. Wegenek); Dunellon, 22 July 1939 (D. E. Hardy); Gainesville, 18 April 1913, 28 May 1918, 30 May 1916 (JRW); Hillsboro, 28 to 31 August 1946 (MSN, MDN); Hudson, 13 July 1939 (J. D. Beamer, A. T. Hardy); La Belle, 16 July 1939 (R. H. Beamer, P. B. Lawson); Largo, 22 to 29 August 1931 (Bradley and Knorr); Live Oak, 16 August 1940 (J. D. Haynie); Sanford, 8 August 1939 (R. H. Beamer, D. E. Hardy).

Specimens are known from the following localities in *Florida*: Davenport, 5 August 1930 (J. Nottingham); Fort Mead, 11, 13 August 1930 (R. H. Beamer, J. Nottingham, P. W. Oman); Fort Lauderdale, 23 to 29 June, 4 July 1933, 13 June, 28 August, 8 September 1932 (D. M. and M. Bates); Fruitville, 3 August 1930 (R. H. Beamer, L. D. Tuthill); Hilliard, 19 August 1930 (R. H. Beamer, J. Nottingham, P. W. Oman); Sanford, 4 August 1930 (R. H. Beamer, J. Nottingham).

MALE. Length 16 mm. Mystax sparse, black bristles above and mostly yellowish bristles on oral margin and short white hairs; face at antennae 33/45 width of one eye, vertex 25. Antennae black haired, segments measure 13-6-13-30.

Anterior mesonotal hairs subequal in length to antennal segment 2. Scutellar hairs sparse yellowish as long as antennal segment 1, 2 black marginal bristles.

Sides and posterior margins of abdominal segments 2-5 gray, 6 white and 7 all white; dorsum 2-6 brown with black hairs, hairs on sides yellowish, longer on 1-2. Venter gray pollinose, 3-7 narrowly bare at middle, hairs erect white on 1-3, short on 4-6, longer on 7. Segment 8 black, hairs black and yellowish on tergite, sternite with long white hairs apically. Terminalia black, hairs black; surstyli with a few white hairs, and above at apex with a dense brush of coarse black and white hairs; fringe black, subequal in length to antennal segment 1.

Wings hyaline, light brownish apically, veins brown, anterior crossvein at 32/46 length of discal cell, stump vein short, costa slightly dilated, subcostal cell brown.

FEMALE. Length 19 mm. Sides and posterior margins of abdominal segments 2-6 gray pollinose, dorsum of 2-7 brown with black hairs, sides of 2-5 with short white hairs, longer on 1-2. Venter gray pollinose, bare at middle of 3-7, hairs erect white on 1-4, short on remainder, black apically on 6-7. Ovipositor black, 4.7 mm. long, at middle 1/8 as wide as long.

ALBIBARBIS GROUP (BARBATUS GROUP)

Hine (1919) defines this group (his Barbatus Group) as follows: "The

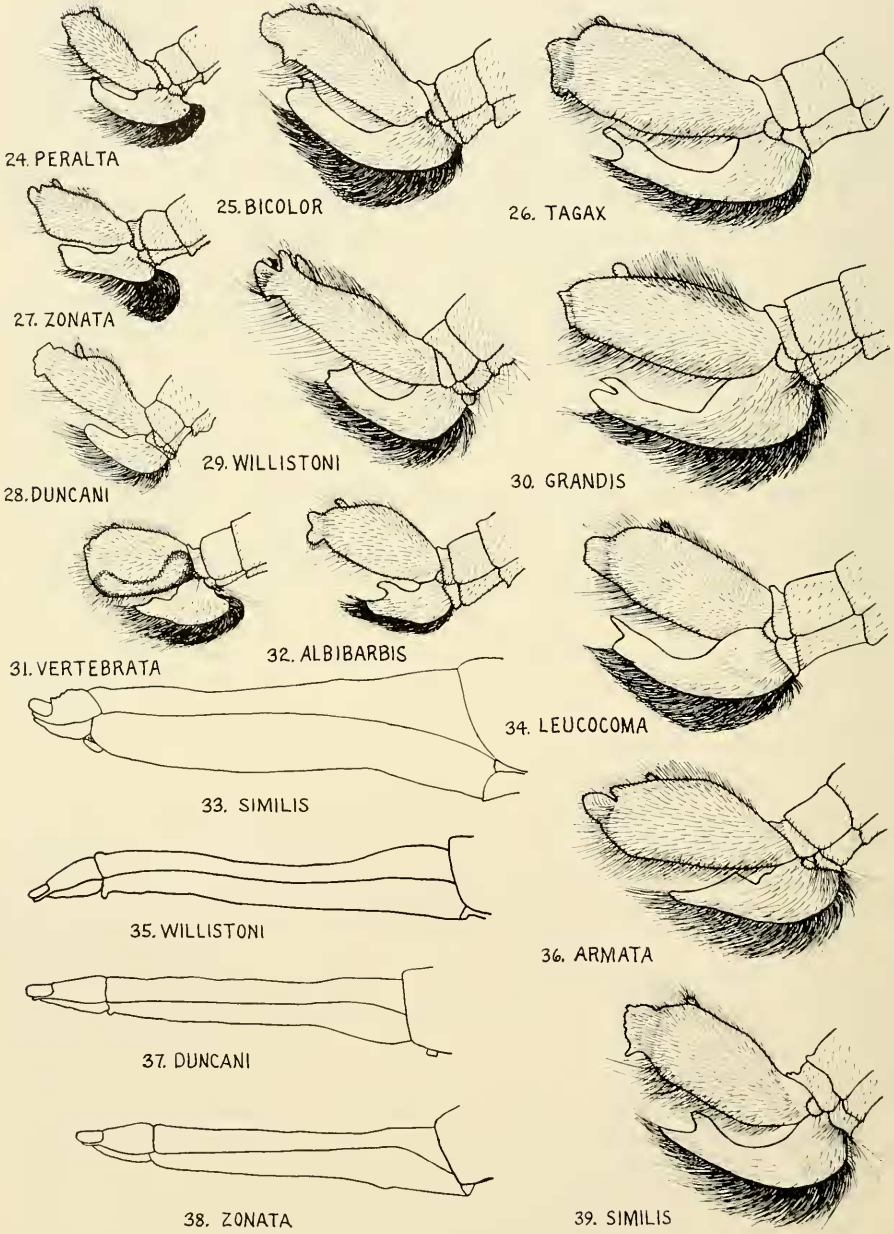
members of this group have a broad mesothorax, quite evenly curved, short-haired all over, especially anterior to the transverse suture. Only a few prominent bristles above the attachment of the wings and posteriorly. Scutellum short-haired on the disc, and usually with not more than half a dozen bristles on the margin, although occasional specimens may have one or two more than this number, in most cases there are less. Branching of the third vein never anterior to the base of the second posterior cell, occasionally it is opposite the base of this cell, but in nearly all cases it is plainly beyond, making the second submarginal cell short. The posterior branch of the third vein bends forward, and reaches the costa distinctly before the apex of the wing.

"In some species the male has the costa thickened and expanded on the anterior margin, somewhat before the apex, but in other species this is not the case."

The short more or less recumbent hairs anteriorly on the mesonotum, subequal in length to antennal segment 2, applies to all the Nearctic species except *E. willistoni* (Hine). In *E. willistoni* the mesonotal hairs are erect and anteriorly are as long as antennal segment 1 and gradually lengthen apically, has the mesonotum highly arched and compressed, has the body metallic black in color, and although it lacks a definite mesonotal crest, it has been placed in the Carinata Group in order to unify the Albibarbis Group.

KEY TO THE SPECIES OF THE ALBIBARBIS GROUP—MALES

1. Large flies, 25-40 mm. in length (a few specimens of *E. bicolor* may be as small as 19 mm.) 2
 Smaller flies, 20 mm. in length or less 7
2. Hind tibiae apically bent forward and enlarged 3
 Hind tibiae straight and not abnormally enlarged apically 5
3. Mystax white to yellow; apical 3/5 of the hind tibiae enlarged; scutellar hairs white or yellowish; abdominal segments 6-7 white pollinose, 6 with a black spot dorsally; length 29-32 mm. (Texas) *E. armata* (Hine)
 Part of the bristles of the mystax black; apical 2/5 of the hind tibiae enlarged 4
4. Femora reddish above; hind tibiae only moderately enlarged; scutellar hairs in part white; length 24-31 mm. (Arizona, Texas) *E. tagax* (Williston)
 Femora black; hind tibiae greatly enlarged; scutellar hairs black; length 25-26 mm. (Arizona, New Mexico) *E. similis* (Williston)
5. Hairs and bristles of the head all pale yellowish; abdomen grayish white pollinose with short white hairs; costa of wings not dilated but subcostal cell light brown; length 25-34 mm. (Kansas, Oklahoma, Texas) *E. leucocoma* (Williston)
 Mystax in part black; palpi at least partly black haired; abdominal segments 2-5 or 2-6 black basally with short black hairs; costa of wings dilated 6
6. Narrow basal section of abdominal segments black haired; normally 2 scutellar bristles, discal hairs white; surstyli with ventral tooth at apical 4/5; length 21-26 mm. (Arizona, California, Mexico, Mississippi, New Mexico, Texas) *E. bicolor* (Bellardi)
 Broad dorsum of abdominal segments black haired; usually 6 scutellar bristles, discal



- hairs all or largely black; surstyli without ventral tooth; length 32-35 mm. (Texas) *E. grandis* (Hine)
7. Mystax usually wholly pale; frons at vertex as wide as at antennae; abdominal segments 2-5 with 2 black spots dorsally; anterior crossvein at or slightly beyond middle of discal cell; length 13-20 mm. (Coast to Coast in United States, Canada to Guatemala) *E. albibarbis* (Macquart)
- Mystax in part black; frons narrower at vertex than at antennae; anterior crossvein at $2/3$ length of discal cell or more 8
8. Abdomen wholly gray and light brown pollinose, hairs white; scutellar hairs and bristles white; tibiae and tarsi yellowish to brown; terminalia reddish brown, apical flange of surstyli black; length 14-17 mm. (Arizona) *E. duncani*, new species
- Abdominal segments 2-5 black basally with short black hairs 9
9. Terminalia in dorsal view wider than the abdomen, surstyli with a rounded ridge along the ventral margin, fringe on lower forceps of uniform width; length 14-19 mm. (California) *E. vertebrata* (Bromley)
- Terminalia narrower than the abdomen in dorsal view 10
10. Apical margin of the surstyli straight, angle with axis about 60° , lower margin with a suggestion of a ridge, fringe on lower forceps much wider at base than at apex; length 15-19 mm. (Arizona, Nevada, Utah) *E. zonata* (Hine)
- Apical margin of the surstyli slightly convex, angle with axis about 80° , no suggestion of a ridge on the ventral margin, fringe on lower forceps of uniform width from base to apex; length 13-19 mm. (California) *E. peralta*, new species

KEY TO THE SPECIES OF THE ALBIBARBIS GROUP—FEMALES

1. Large flies, 25-40 mm. in length (a few specimens of *bicolor* may be as small as 19 mm.) 2
- Smaller flies, 20 mm. in length or less 7

←

FIGURES 24-39. Albibarbis Group, lateral views of the male terminalia and ovipositors of the *Efferia* species:

24. *E. peralta*, new species, male terminalia.
 25. *E. bicolor* (Bellardi), male terminalia.
 26. *E. tagax* (Williston), male terminalia.
 27. *E. zonata* (Hine), male terminalia.
 28. *E. duncani*, new species, male terminalia.
 29. *E. willistoni* (Hine), male terminalia, Carinata Group.
 30. *E. grandis* (Hine), male terminalia.
 31. *E. vertebrata* (Bromley), male terminalia.
 32. *E. albibarbis* (Macquart), male terminalia.
 33. *E. similis* (Williston), ovipositor.
 34. *E. leucocoma* (Williston), male terminalia.
 35. *E. willistoni* (Hine), ovipositor, Carinata Group.
 36. *E. armata* (Hine), male terminalia.
 37. *E. duncani*, new species, ovipositor.
 38. *E. zonata* (Hine), ovipositor.
 39. *E. similis* (Williston), male terminalia.

2. Mystax wholly white or yellow 3
 Mystax with black bristles above and usually some below laterally, remainder pale
 yellow or white 4
3. Abdomen wholly white haired and yellowish gray pollinose; scutellum with white
 hairs and bristles; ovipositor tapers from base to apex, 5.9 mm. long *E. leucocoma*
 Abdominal segments 2-5 black basally and black haired, 6-7 largely black and black
 haired; scutellar bristles black, hairs largely black; ovipositor tapers on basal 1/3,
 5.6 mm. long *E. armata*
4. Disc of scutellum with white hairs as long as antennal segments 1-2, usually 2 black
 scutellar bristles; ovipositor 5.6 mm. long *E. bicolor*
 Disc of scutellum all or in part black haired, usually 4 or more marginal bristles 5
5. Femora reddish above on its whole length; ovipositor 7.0 mm. long *E. tagax*
 Femora black, sometimes the tips reddish 6
6. Abdominal tergite 6 laterally and the sternite white haired; ovipositor broad, 5.0
 mm. long *E. similis*
 Abdominal segments 6-7 black and black haired; ovipositor 7.1 mm. long *E. grandis*
7. Mystax usually all white; frons at vertex as wide as at antennae; anterior crossvein
 at or near middle of discal cell; ovipositor 3.0 mm. long *E. albibarbis*
 Mystax in part black; frons at vertex narrower than at antennae; anterior crossvein
 at least at 2/3 length of discal cell 8
8. Abdominal segments 1-6 wholly white haired and gray and brown pollinose; ovipositor
 4.4 mm. long *E. duncani*
 Abdominal segments black basally and black haired 9
9. Usually 4 bristles below on anterior side of hind femora; mesonotum largely golden
 brown pollinose; venter of abdominal segments 1-3 with erect white hairs, tergite
 3 with short black hairs basally; ovipositor 4.0-4.1 mm. long *E. peralta*
 Five to 7 bristles below on the anterior side of the hind femora; mesonotum largely
 grayish pollinose; sternites 1-4 or 1-5 with erect white hairs 10
10. Discal hairs of scutellum not longer than antennal segment 1, half or largely black;
 sternopleura with sparse hairs (about 15); usually 7 bristles on anterior side of
 hind femora below; ovipositor 3.5-3.7 mm. long *E. zonata*
 Discal hairs of scutellum as long or longer than antennal segments 1-2, usually largely
 white; sternopleura with tuft of hairs (about 30); 5-6 bristles below on hind
 femora; ovipositor 4.0-4.1 mm. long *E. vertebrata*

***Efferia albibarbis* (Macquart).**

Erax albibarbis MACQUART, 1838, *Diptera exotique ou peu connus*. Paris. Vol. 1, no. 2, p. 117.
 Type N. A.

Erax barbatus HINE, 1919, *Ann. Entomol. Soc. Amer.*, vol. 12, p. 109. Description, figures of
 wing and male genitalia; range from Guatemala and Baja California to Washington and
 New England.

Efferia albibarbis, MARTIN, 1962, *Jour. Kansas Entomol. Soc.*, vol. 35, p. 251. Description and
 designation of neotype male, Bainbridge, Ohio, USNM.

SYNONYMS. *E. barbatus* authors not Fabricius, *E. pumilis* (Walker),
E. cinerescens (Bellardi), *E. tricolor* (Bellardi), and *E. furax* (Williston).

Our most common species of *Efferia* as mentioned by Hine (1919). One
 of the first to appear in the spring and persists until early fall. In California

it occurs from April to October and is found mainly at lower elevations but occurs up to 6,000 feet in the mountains of southern California.

MALE. Length 16 mm. Hairs and bristles of the head all white; face at the antennae 40/48 width of one eye, vertex 40; antennae measure 14-6-16-32. Scutellar hairs white and subequal in length to antennal segment 1, 8 white marginal bristles. Abdominal segments 1-5 and 8 gray, 6-7 white, 2 with small brown basal spots, 3-5 black basally usually bisected; hairs short white, longer on sides of 1-3, 4-5 and 8 with short black hairs dorsally; venter 1-5 and 8 gray, 6-7 white, hairs erect white on 1-4, short otherwise except posterior margin 7-8 with longer white hairs. Terminalia black; dorsal hairs of surstyli black and a few black hairs laterally and on ventral margin but largely white; lateral hairs on lower forceps white, fringe black and about as long as antennal segment 2. Femora black, tibiae and tarsi yellowish red, tips darker. Wings hyaline, veins brown, anterior crossvein at 41/71 length of discal cell, costa not dilated, stump vein as long as anterior crossvein.

FEMALE. Length 19 mm. Sides and posterior margins of abdominal segments grayish white pollinose, 3-7 black dorsally with short black hairs; venter white pollinose with white hairs, short erect on 1-3; ovipositor black, brownish or reddish basally, 3.0 mm. long.

***Efferia armata* (Hine).**

Erax armatus HINE, 1918, Occas. Paper Mus. Zool., Univ. Mich., vol. 61, p. 4. Types, male and female, Phantom Lake, Fort Davis Quadrangle, Davis Mountains, Texas (F. M. Gaige) UM. Male Costula (Cotulla), Texas (F. C. Pratt), USNM.

Erax armatus HINE, 1919, Ann. Entomol. Soc. Amer., vol. 12, p. 112. Description of male and female. Records this species from Uvalde, Texas, June, and July.

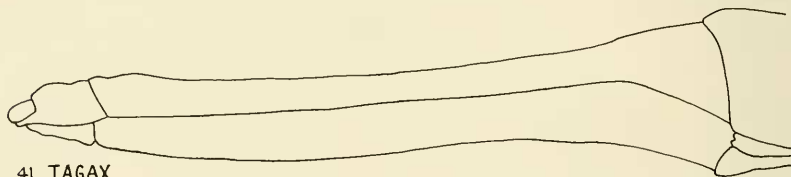
Bromley (1934) reports this from following locality in Texas: Bexar County, June 16, 1929, July 5, 1932 (H. B. Parks).

Specimens are known from the following localities. Texas: Hidalgo County, 2 July 1933 (S. W. Bromley); 18 mi. N.W. Ft. Stockton, 11 July 1936 (D. R. Lindsay); Sabinal, 6 July 1936 (J. D. Beamer); 47 mi. W. Sheffield, 7 July 1936 (W. D. Field).

MALE. Length 29 mm. Hairs and bristles of head yellow to white; 2 bristles on ocellar tubercle, upper occipitals and hairs at tip of palpi, black; face 58/64 width of one eye, vertex 48; antennae measures 17-9-20-42. Mesonotum gray pollinose, divided central stripe and intermediate spots brown; hairs short black, a few yellowish anteriorly, on humeri and laterally behind suture; bristles black; hairs posteriorly in central row longer black. Scutellum gray pollinose, hairs yellowish, 5 yellowish and 2 black marginal bristles. Abdomen white pollinose, dorsum of 2-6 brown with short black hairs, hairs yellowish on sides of 1-5 becoming shorter apically, short white on 6-7; venter white pollinose, erect white hairs on 1-5 becoming shorter



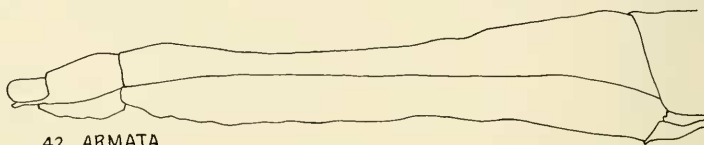
40. GRANDIS



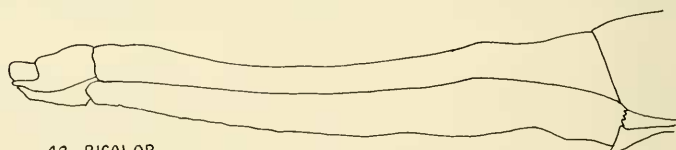
41. TAGAX



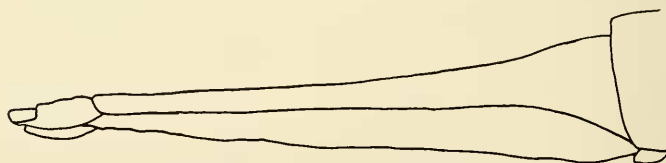
44. SIMILIS



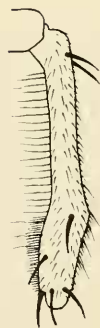
42. ARMATA



43. BICOLOR



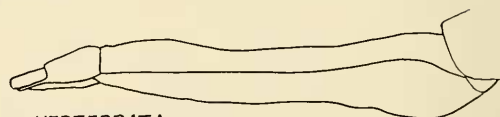
45. LEUCOCOMA



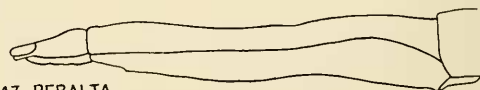
48. TAGAX



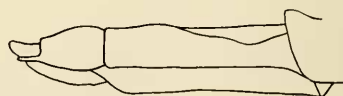
49. ARMATA



46. VERTEBRATA



47. PERALTA



50. ALBIBARBIS

apically, short white on 6-7, 7 with a few black at middle and longer yellowish on apical margin. Terminalia brown, hairs black, fringe as long as antennal segments 1-2. Femora brown, tips and hind ones lighter; tibiae yellowish, tips and tarsi brown, hairs on basal 3/4 of hind tibiae yellow, black apically. Wings hyaline, veins brown, anterior crossvein at 62/76 length of discal cell, very short stump vein, costa slightly dilated, subcostal cell dark brown.

FEMALE. Length 29 mm. Broad sides and narrow posterior margins of abdominal segments 2-5 and 6 basally and laterally gray pollinose, dorsum 2-6 black with short black hairs, hairs on sides of 1-5 white, longer on 1-3; 7 shining black with black hairs; venter 1-6 gray pollinose, 1-5 with erect white hairs becoming shorter apically, 6 mostly and 7 all short black haired; ovipositor black, 5.6 mm. long, basal 1/3 tapering, at middle 1/9 as wide as long.

Efferia bicolor (Bellardi).

Erax bicolor BELLARDI, 1861, Saggio di Ditterlogia Messicana, vol. 2, p. 47. Type, male, Mexico.

Erax bicolor, HINE, 1919, Ann. Entomol. Soc. Amer., vol. 12, p. 110. Description of male and female, figure of male genitalia; reports from Mexico, Texas, Mississippi, New Mexico, and Arizona.

Bromley (1934) reports from following localities in *Texas*: Bexar County, June 7-12, 1929 (H. B. Parks); Big Bend Region, summer 1928 (F. F. Bibby); Brownsville, August 3, 1921 (C. D. Duncan); Kingsville, July (F. M. Hull); McMullen County, July 12, 1932 (S. E. McGregor) in apiary; Presidio, June 26, 1928 (F. L. Thomas).

Specimens are known from the following localities. *Arizona*: Cochise, Gila, Graham, Maricopa, Pima, and Pinal counties, June to November. *California*: Inyo, Lassen, Los Angeles, Mono, Riverside, San Bernardino, and

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FIGURES 40-50. Albibarbis Group, lateral views of ovipositor and male hind tibiae of the *Efferia* species:

40. *E. grandis* (Hine), ovipositor.
41. *E. tagax* (Williston), ovipositor.
42. *E. armata* (Hine), ovipositor.
43. *E. bicolor* (Bellardi), ovipositor.
44. *E. similis* (Williston), male hind tibiae.
45. *E. leucoma* (Williston), ovipositor.
46. *E. vertebrata* (Bromley), ovipositor.
47. *E. peralta*, new species, ovipositor.
48. *E. tagax* (Williston), male hind tibiae.
49. *E. armata* (Hine), male hind tibiae.
50. *E. albibarbis* (Macquart), ovipositor.

San Diego counties, June to September. *New Mexico*: Eddy, Hidalgo, Otero, and Santa Fe counties, July.

MALE. Length 22 mm. Hairs and bristles of head yellowish to white; usually about 12 bristles in mystax, 2 on ocellar tubercle, upper occipitals and hairs apically on palpi, black; face at antennae 40/49 width of one eye, vertex 29; antennae measure 15-7-15-34. Mesonotum gray pollinose, divided central stripe and intermediate spots brown; hairs black subequal in length to antennal segment 2, all margins and humeri in part white haired, long black posteriorly; bristles black. Scutellum gray pollinose, erect white hairs as long as antennal segment 1-2, usually 2 black marginal bristles but as many as 4-5. Abdomen gray pollinose, dorsum 2-5 and 6 narrowly brown with short black hairs, hairs otherwise short white but longer on 1-2; venter grayish white pollinose, hairs erect white on 1-2 or 1-3, short otherwise except 7 apically; 8 black, dorsal hairs mostly black, ventral hairs white. Terminalia black, hairs black, some white at apex dorsally and on ventral margin of surstyli and on sides of lower forceps; fringe brown with a few white hairs laterally, as long as antennal segment 1. Legs black, tibiae except tips yellowish red. Wings hyaline, veins light brown, anterior crossvein at 46/56 length of discal cell, short stump vein, costa slightly dilated, subcostal cell light brown.

FEMALE. Length 24 mm. Abdominal segments 1-6 gray pollinose, dorsum 2-6 black basally with short black hairs, 7 black and 6-7 with all black hairs, hairs short white otherwise, longer on 1; venter 1-6 gray pollinose, hairs white erect on 1-3, short white on 4-5, short black on 6-7; ovipositor black, 5.6 mm. long, at middle 1/8 as wide as long.

***Efferia duncani* Wilcox, new species.**

MALE. Length 16 mm. Head black, face and frons yellowish gray, occiput gray pollinose. Mystax white with about 12 stout black bristles above; face at antennae 33/47 width of one eye, vertex 23; hairs on frons and occipital bristles yellowish white; 1 black and 1 yellowish bristle on ocellar tubercle; beard, hairs on proboscis and below on palpi white, black apically on palpi. Antennae black, hairs white, segments measure 12-7-16-30.

Mesonotum black, grayish brown pollinose, central stripe and intermediate spots appearing black at most angles. Anterior hairs black, semierect, as long as antennal segment 2, longer and mostly white posteriorly; humeri and all margins with sparse white hairs. Bristles yellowish white, 2 presutural, 2 supraalar, 2 postalar, 3 white and 2 weak black posterior dorsocentral and 2 weak black anterior ones. Pleura grayish pollinose, hairs and bristles white, a few short sparse black hairs on mesopleura. Scutellum gray pollinose, erect white hairs as long as antennal segments 1-2, 2 strong and 2 weak white marginal bristles.

Abdomen black, 1-5 gray, 6-7 white and dorsum 2-6 light brown pollinose; hairs short white, long on sides of 1-3; venter grayish white pollinose, hairs short white, long erect on 1-3 and a few on 4 and apical margin of 7; 8 brown, short black hairs above, longer black and white below. Terminalia reddish brown, apical flange of surstyli black; hairs black, a few short yellowish above apically on surstyli and 2 longer at apex below; fringe black as long as antennal segment 1.

Femora black, reddish at tips; tibiae yellowish red, tips and tarsi brown. Hairs white, a few erect hairs on fore femora and shorter hairs above on tarsi black. Bristles black, yellowish in part on fore tibiae and on all tarsi. Claws black, base reddish; pulvilli yellowish brown; empodia brown.

Knob of halteres yellowish, stem white, base brown. Wings hyaline, veins yellowish to brown, anterior crossvein at $31/48$ length of discal cell, short stump vein, costa not dilated.

FEMALE. Length 16 mm. Scutellar hairs not longer than antennal segment 2. Abdomen grayish white pollinose, dorsum of 2-5 with 2 brownish basal spots and 6 largely brownish pollinose, base of 7 brown bare; hairs short white, longer on sides of 1-3. Venter grayish pollinose, center of 3-6 and 7 apically black and bare of pollen; hairs white erect on 1-5, a few black apically on 7. Ovipositor black, 3.8 mm. long, at middle $1/6$ as wide as long.

HOLOTYPE. Male, San Carlos Lake, Arizona, July (D. K. Duncan), CAS.

ALLOTYPE. Female, same data.

PARATYPES. 4♂♂, 2♀♀, same data, and August, JW; 1♀, Bartlett Dam, 13 July 1960 (J. E. Gillespy), CAS; 1♂, Sabino Canyon, Santa Catalina Mountains, Arizona, 13 August 1924 (E. P. Van Duzee), CAS; 1♂, 1♀, Santa Rita Mountains, June (D. K. Duncan), CAS; 1♂, 26 mi. E. of Gila Bend, Arizona, 7 August 1962 (J. Wilcox) JW.

Named in honor of D. K. Duncan of Globe, Arizona, who collected most of these specimens and many other Asilidae in Arizona. In his notes he lists this locality as, Rupkeys Boat Landing Bay, San Carlos Lake, 3,000 feet, August 1, 1933, sitting on damp sand near the water.

Efferia grandis (Hine).

Erax grandis HINE, 1919, Ann. Entomol. Soc. Amer., vol. 12, p. 111. Types, male and female, Round Mountain, Texas, ANSP.

Bromley (1934) reports from the following localities in Texas: Bexar County, June 25, 1930 (H. B. Parks); Brownwood, August 22 (F. M. Hull); Hidalgo County, May 26, 1930 (J. C. Gaines); Mason, July 28, August 23 (R. H. Painter); Pecos River, Sheffield, July 23 (Duncan); 11 mi. N.W. of Sanderson, July 21 (Duncan); Weslaco, May 25, 1930 (J. C. Gaines). He says, "*E. grandis*, *bicolor* and *armatus* occur in mesquite groves, resting on twigs or trees and resemble, in habits and appearance, large *E. aestuans*."

Specimens are known from the following localities. *Texas*: Bexar County, 6, 12 June 1929 (H. B. Parks); Carrizo Springs, 19 June 1928 (W. A. Frazier); Concan, 6 July 1936 (J. D. and R. H. Beamer); San Antonio (H. B. Parks); Seymour, 30 June 1936 (M. B. Jackson); 47 mi. W. of Sheffield, 10 July 1936 (M. B. Jackson); Uvalde, 11 August 1933, prey, honey bee; Weslaco, 28 May 1933 (S. W. Bromley).

MALE. Length 32 mm. Mystax, a few hairs on frons, beard, hairs on proboscis and below on palpi, white; many black bristles above in mystax and a few below on sides, hairs on frons largely, occipital bristles largely, 2 on ocellar tubercle and hairs on palpi largely, black; face at antennae 52/66 width of one eye, vertex 35; antennal hairs black, segments measure 24-9-19-48. Mesonotum yellowish gray pollinose, divided central stripe and intermediate spots brown but appearing black; hairs short black, a few on humeri and laterally behind suture white; bristles and longer hairs posteriorly black. Scutellum grayish pollinose, hairs black and yellowish, 3-5 black marginal bristles. Abdominal segments 1-5 gray, 6-7 white pollinose, dorsum 2-5 black with short black hairs; hairs otherwise short yellowish, longer on sides of 1-2; venter gray, 1-3 with erect white hairs, shorter on 4-7. Terminalia black, hairs black, fringe black and at the middle as long as antennal segments 1-2. Legs black, basal 3/4 of tibiae reddish. Wings very lightly infuscated, veins brown, anterior crossvein at 70/93 length of discal cell, stump vein short, costa slightly dilated, subcostal cell brown.

FEMALE. Length 38 mm. Broad sides and posterior margins of abdominal segments 1-5 gray pollinose, dorsum 2-5 black with short black hairs, laterally with short yellowish hairs, 6-7 shining black with black hairs; venter 1-5 and base of 6 gray pollinose, hairs erect yellowish on 1-5, shorter apically, 6-7 short black haired; ovipositor 7.1 mm. long, at middle 1/10 as wide as long.

***Efferia leucocoma* (Williston).**

Erax leucocomus WILLISTON, 1885, Trans. Amer. Entomol. Soc., vol. 12, p. 69. Types male and female, western Kansas (E. W. Guild, F. H. Snow), UK.

Erax leucocomus, HINE, 1919, Ann. Entomol. Soc. Amer., vol. 12, p. 114. Description of male and female, reports from western Kansas (F. X. Williams) and Dallas, Texas, September 5, 1905 (F. C. Bishop).

Bromley (1934) reports this species from *Texas*, Goldthwaite, May 29, 1933 (S. E. McGregor).

Specimens are known from the following localities. *Kansas*: Barber County, 4 July 1925 (H. J. Grady); Kiowa County, 5 July 1933 (R. H. Beamer); Logan County, 22 June 1925 (R. H. Beamer); Rawlins County, 4 July 1925 (H. J. Grady); Scott County, 18 to 25 June 1925 (R. H. Beamer, Howard Deay, H. J. Grady); prey, cicada. *Oklahoma*: Cimarron County, 3 July 1933 (A. E. Pritchard). *Texas*: George West, 4 July 1936 (W. D. Field); Melissa, 11 July 1935; San Antonio, 1 July 1936 (M. B. Jackson).

MALE. Length 26 mm. Hairs and bristles of head all yellowish white; face 48/52 width of one eye, vertex 32; antennae measure 15-7-16-41. Mesonotum yellowish gray pollinose, divided central stripe and intermediate spots brown; hairs short black, white in part on humeri and margins and in central row posteriorly; bristles yellowish white. Scutellar hairs white and usually 6 white marginal bristles. Abdominal segments 1-5 grayish, 6-7 whitish pollinose; hairs short white, longer on 1 and venter 1-2; segment 8 brown, hairs coarse white. Surstyli brown, hairs black, yellowish at tip dorsally; lower forceps yellowish brown, hairs black, fringe brown to black and as long as antennal segment 1. Femora dark brown, tibiae yellowish, tips and tarsi brown. Wings hyaline, veins light brown, anterior crossvein at 45/71 length of discal cell, short stump vein, costa not dilated, subcostal cell light brown.

FEMALE. Length 31 mm. Abdomen grayish white pollinose, broad base of 7 brown, hairs short white, longer on 1 and venter 1-2; ovipositor black, 5.9 mm. long, gradually tapers apically, at middle 1/9 as broad as long.

Efferia peralta Wilcox, new species.

MALE. Length 16 mm. Head black; face yellowish white, frons yellowish, occiput grayish white, pollinose. Mystax yellowish white, 12 black bristles above and 1 on one side below; face at antennae 32/45 width of one eye, vertex 20; hairs on frons white; 2 black bristles and several black hairs on ocellar tubercle; occipital bristles yellowish; beard, hairs on proboscis and basally on palpi, white, black apically on palpi. Antennae black, yellowish pollinose, hairs white, segments measure 14-6-13-28.

Mesonotum black; yellowish brown pollinose, divided central stripe and intermediate spots brown. Hairs erect black, as long as antennal segment 2; a few white hairs anteriorly, on humeri and lateral margins. Bristles black, 2 presutural, 2 supraalar, 2 postalar, 3-4 slender posterior dorsocentral and some longer hairs. Pleura and coxae grayish golden pollinose, hairs and bristles white, 2-3 fine black hairs on mesopleura. Scutellum grayish golden pollinose, hairs erect, half yellowish and half black and about as long as antennal segment 1; 5 black marginal bristles.

Abdomen black; segment 1, sides and posterior margins 2-5 grayish, 6-7 white, apical half 7 brownish pollinose, dorsum 2-5 black; hairs short white, longer on sides of 1-3, 3-5 with short black hairs dorsally, 2-3 on sides with some longer black hairs. Venter grayish white pollinose, hairs white erect on 1-4, short on 5-7 except apical margin of 7 with longer hairs. Segment 8 black with black hairs. Terminalia reddish brown, hairs black, some yellowish at apex above on surstyli; fringe dense black, as long as antennal segments 1-2.

Legs black, basal 3/4 of tibiae reddish; bristles black; hairs white on femora, short black above apically on all and below on hind ones; hairs on

tibiae yellowish, black dorsally on fore and hind ones; hairs black on tarsi. Claws black, base reddish; empodia and pulvilli brown.

Halteres yellowish, base brown. Wings hyaline, veins brown, anterior crossvein at 41/60 length of discal cell, third vein with short stump vein, costa slightly dilated, subcostal cell brown.

FEMALE. Length 18 mm. Face whitish and frons yellowish white pollinose; 10 black bristles above in mystax; 2 occipital bristles on one side and 1 on other, black. Discal hairs of scutellum mostly black. Narrow sides and posterior margins of abdominal segments 2-6 grayish pollinose; hairs short black; white on 1, sides of 2-4 and posterior margins 2-5, longer on sides of 1-2 and a few longer black on 2; 7 shining black and black haired; venter 1-6 yellowish gray pollinose, hairs erect white on 1-4, short on 5; 6-7 short black haired. Ovipositor black, 4.1 mm., long, at middle 1/10 as wide as long. Third vein with long stump vein, costa not dilated but subcostal cell light brown.

HOLOTYPE. Male, Peralta (4 mi. E. of Olive), Orange County, California, 4 September 1955 (Guy F. Toland), CAS.

ALLOTYPE. Female, same data.

PARATYPES. *California*: 53♂♂, 42♀♀, same data and 21 June, 15, 18 July 1957, 5, 8 August 1956, 15 August 1962 (Guy F. Toland, Itol J. and J. Wilcox), JW; 2♂♂, Claremont, 22 June 1941 (J. Wilcox), JW; 3♂♂, 3♀♀, East Highlands, 8 June 1964 (M. W. Stone), JW; 4♂♂, 4♀♀, Idyllwild, 3 August 1935 (E. I. and Jack Beamer, Jean Russell), JW; ♂, ♀, Joshua Tree N. M., L. Covington Flat and Smithwater Wash, 6 August 1960 (M. Knox, E. Sleeper), CSCLB; 27♂♂, 10♀♀, Riverside, 8, 15 June 1941 (John, Joe Jr. and J. Wilcox), JW; 1♂, Laguna Beach, 23 August 1921 (C. T. Dodds), CIS; 1♂, Laguna Canyon, 10 September 1963 (M. E. Irwin), UCR; 1♂, La Jolla, 5 July 1935 (A. J. Basinger), CAS; 1♂, San Diego, 6 July 1921, CIS; 1♂, San Diego County, 4 July 1920 (L. D. Anderson), JW; 1♂, 1♀, Santa Rosa Mountain, 24 May 1936 (A. J. Basinger), CAS; 1♂, Whittier, 22 July 1930, JW.

Efferia similis (Williston).

Erax similis WILLISTON, 1885, Trans. Amer. Entomol. Soc., vol. 12, p. 68. Type, male, Arizona, UK.

Hine (1919) listed this species as a synonym of *E. tagax*.

Female specimens similar to those of *E. tagax* with a shorter, broad ovipositor have been known for a number of years but only recently was a male found which appears to be associated with these females.

MALE. Length 26 mm. Head black, gray pollinose; mystax white, a few black hairs below and about 15 black bristles laterally and above; face at antennae 45/64 width of one eye, vertex 35; hairs on frons, occiput,

proboscis and below on palpi white, apical hairs on palpi black; 2 bristles on ocellar tubercle and 4-5 upper occipitals black, remainder yellowish white. Antennae black, hairs white, a few above black, segments measure 18-11-18-40.

Mesonotum black, humeri reddish; grayish pollinose, central stripe and intermediate spots brownish; hairs black, shorter than antennal segment 2, a few on humeri and laterally behind suture white; bristles black, 2 presutural, 1 supraalar, 2 postalar, 2 posterior dorsocentral. Pleura grayish brown pollinose, hairs and bristles white, a few sparse fine black hairs mainly on mesopleura. Scutellum grayish pollinose, discal hairs black and as long as antennal segment 2, 6 black marginal bristles.

Abdomen black, grayish pollinose (largely greased), hairs white, longer on sides of 1-3, short black dorsally on 2-5; venter grayish pollinose, hairs erect white on 1-5, short on 6-7. Terminalia black, hairs black; sides of surstyli and lower forceps with short yellowish hairs, fringe black and about as long as antennal segments 1-2.

Femora black, tibiae and tarsi reddish brown, apical 2/5 of hind tibiae enlarged. Bristles black; hairs white, dorsally on fore femora and tibiae and on all tarsi, black. Claws black, base reddish; empodia and pulvilli light brown.

Halteres light brown. Wings tinged with brown especially along veins, veins brown, anterior crossvein at 70/91 length of discal cell, short stump vein, costa dilated, subcostal cell brown.

FEMALE. Length 26 mm. Broad sides and narrow posterior margins of abdominal segments grayish pollinose with short white hairs, dorsum black with short black hairs; venter 1-6 gray pollinose with erect white hairs; 7 black with black hairs, longer on the sternite; ovipositor black, 4.3 mm. long, at middle 1/4 as broad as long. Wings hyaline, costa not dilated, third vein with long stump vein.

Described from a male, Skelton Canyon, Peloncillo Mountains, Arizona, 27 July 1959 (M. A. Cazier), AMNH, ♀, Southwestern Research Station, 5 mi. W. of Portal, Arizona, 12 July 1957 (M. Statham), AMNH. Other females from following localities: *Arizona*: Southwestern Research Station, 5 mi. W. of Portal, 19 July 1959 (M. Statham); Sabino Canyon, 12 July 1932 (R. H. Beamer); Santa Rita Mountains, 24 July 1927 (R. H. Beamer). *New Mexico*: Guadalupe Mountains, 15 and 17 mi. W. of Cloverdale, 27 July 1963 (M. A. Cazier, M. Mortenson, J. Wilcox).

Efferia tagax (Williston).

Erax tagax WILLISTON, 1885, Trans. Amer. Entomol. Soc., vol. 12, p. 65. Type, male, Arizona, UK. Females were taken with the male.

Erax tagax, HINE, 1919, Ann. Entomol. Soc. Amer., vol. 12, p. 113. Description of male and female, reports from Arizona.

Bromley (1934) reports this species from following locality in *Texas*: Livermore Park, Davis Mountains, July 9 (Duncan).

Specimens are known from the following localities in *Arizona*: Cochise, Gila, Pima, Pinal, and Santa Cruz counties, June to August, mostly June.

MALE. Length 28 mm. Mystax white, 10 black oral bristles and 2-3 above; hairs and bristles white to yellowish, 2 bristles on ocellar tubercle and 2-3 at apex of palpi, black (upper occipitals black in some specimens); face at antennae 50/68 width of one eye, vertex 38; antennal hairs white, segments measure 20-8-17-41. Mesonotum gray pollinose, divided central stripe and intermediate spots brown; hairs short black, humeri and all margins with some white hairs; bristles black, 2-3 posterior dorsocentral. Scutellum gray pollinose, hairs mostly white, a few black at middle, erect and as long as antennal segment 1, 8 black marginal bristles. Abdominal segments 1-4 gray, 5-7 white pollinose, dorsum of 2-5 and 6 narrowly black to brown, hairs black short dorsally on 2-5, otherwise short white and longer on sides of 1-4; venter gray to white pollinose, hairs erect white on 1-5, short on 6-7; 8 black with short black hairs, apical fringe on sternite yellowish. Terminalia black with black hairs, fringe as long as antennal segment 1. Legs black, dorsum of femora and tibiae except tips, reddish; hind tibiae with erect white hairs ventrally, recumbent yellowish dorsally, dense short black hairs ventrally on apical 2/7. Wings hyaline, veins brown, anterior crossvein at 72/94 length of discal cell, short stump vein, costa dilated, subcostal cell reddish brown.

FEMALE. Length 31 mm. Scutellar hairs mostly black, subequal in length to antennal segment 2, 6 black marginal bristles. Abdominal segments 1-6 grayish white pollinose, narrow dorsum 2-6 brown with a few short black hairs, 7 black with black hairs, hairs otherwise short white, longer on 1-2; venter 1-6 white, 1-5 with erect white hairs, short on 6, 7 black and largely short black haired; ovipositor black, 7.1 mm. long, at middle 1/8 as wide as long.

***Efferia vertebrata* (Bromley).**

Erax vertebratus BROMLEY, 1940, Bull. Brooklyn Entomol. Soc., vol. 35, p. 14. Type, male, Warner Springs, California, July 28, 1938 (Jean Russell); female, Idyllwild, California, July 29, 1938 (Jean Russell), UK. Paratypes from Warner Springs and Towie, California, and Chiricahua Mountains, Arizona, July 14, 1938 (Jean Russell). The paratype from Arizona, a female, probably belongs to *E. zonata*.

Specimens are known from the following localities: *California*: Fresno, Inyo, Kern, Lake, Los Angeles, Madera, Mariposa, Mono, Riverside, San Bernardino, San Diego, Tulare, Tuolumne, and Ventura counties, June to September. Mostly collected in the mountains from 6,000 to 8,000 feet, but a few have been taken at quite low elevations.

MALE. Length 16 mm. Head white pollinose with white hairs and bristles except 11 bristles in mystax and apical hairs on palpi, black; face at antennae 34/52 width of one eye, vertex 24; antennae black, grayish pollinose, hairs white, segments measure 16-6-19-28. Mesonotum yellowish gray pollinose, divided central stripe and intermediate spots brown; hairs on central stripe and intermediate spots black and about 1 1/2 times length of antennal segment 2, white otherwise. Bristles black, 2 presutural, 1 supraalar, 2 postalar, 3-4 weak posterior dorsocentral, posterior hairs mostly long white. Scutellum gray pollinose, erect white hairs as long as antennal segments 1-3, 5 yellowish and 1 black marginal bristles. Abdomen grayish white pollinose, dorsum 2-5 black, hairs white, long on sides of 1-5, a few short black on dorsum 4-5; venter grayish pollinose, hairs erect white on 1-5 and apically on 7; 8 black with black hairs. Terminalia reddish brown; hairs black, surstyli apically with a few yellowish hairs; fringe black as long as antennal segments 1-2. Legs black, basal 4/5 of tibiae reddish; hairs white, above on fore tibiae and all tarsi, black. Wings hyaline, veins brown, anterior crossvein at 49/70 length of discal cell; short stump vein; costa slightly dilated, subcostal cell light brown.

FEMALE. Length 18 mm. Scutellar hairs white and as long as antennal segments 1-2, 4 black and 2 yellowish marginal bristles. Sides and posterior margins of abdominal segments 2-6 grayish white pollinose, 7 brownish apically, dorsum 2-7 black; hairs on sides 1-6 and posterior margins 2-5 white, longer on 1-3; dorsal hairs black. Venter 1-6 grayish white pollinose, hairs erect white on 1-5, short black and white on 6, all black on 7; ovipositor 4.0 mm. long, at middle 1/6 as wide as long.

The scutellar and mesonotal hairs and the erect hairs on the sides of abdominal segments 2-3 vary from nearly all white to nearly all black.

***Efferia zonata* (Hine).**

Erax zonatus HINE, 1919, Ann. Entomol. Soc. Amer., vol. 12, p. 112. Types, male and female, southern Arizona, Aug. 1902 (F. H. Snow), OSU.

In addition to the types, specimens are known from San Antonio Canyon, California and Alamogordo, New Mexico.

No specimens have been seen from California and Hine's specimens from California probably belong to *E. vertebrata* or *E. peralta*. The specimens listed below from Nevada are intermediate between *E. zonata* and *E. vertebrata*. A male specimen from Oklahoma collected and determined by A. Earl Pritchard, probably represents a new species.

Specimens are reported from the following localities: *Arizona*: Chiricahua Mountains, 8 July 1932 (J. D. Beamer); Flagstaff, 14 September 1933 (R. T. Kellogg); Globe, August, September (D. K. Duncan), 24 September 1933 (F. H. Parker) Lot 101; Grand Canyon, 26 July 1926 (E. C. Van Dyke), 11

August 1927 (L. D. Anderson); Granite Reef Dam, 23 June 1963 (Jim Haddock); McMillan, 12 July 1948 (J. Wilcox); base of Pinal Mountains, September (D. K. Duncan); Sierra Ancha Mountains, August (D. K. Duncan); Superior, August (D. K. Duncan); Tempe, 19 August 1934 (A. E. Pritchard). *Nevada*: Montgomery Pass, 14 September 1963 (Itol J. and J. Wilcox). *Utah*: Stansbury I., 13 June 1913 (Hagan Titus).

MALE. Length 15 mm. Head black; white pollinose; mystax white, 10 slender oral and 12 stout bristles above black; face at antennae 30/45 width of one eye, vertex 20; antennal hairs white, segments measure 14-6-11-28. Mesonotum black, grayish pollinose, divided central stripe and intermediate spots brown; hairs black, shorter than antennal segment 2, a few white on humeri and anterior and lateral margins; bristles black, 2 presutural, 2 supraalar, 2 postalar, 3-4 weak posterior dorsocentral. Scutellum gray pollinose, erect hairs mostly black and subequal in length to antennal segment 1, 4 black marginal bristles. Abdomen black, grayish white pollinose, dorsum 2-5 black; hairs short black on dorsum 3-7 and some long on 2, short white otherwise and longer on sides 1-3; venter grayish white pollinose, hairs erect white on 1-4; 8 black with black hairs. Terminalia reddish brown, hairs black, white at tip of surstyli dorsally; fringe black, basally as long as antennal segments 1-3, becoming shorter apically. Femora black, tibiae yellowish red, the tips and tarsi brown. Wings hyaline, veins brown, anterior crossvein at 40/51 length of discal cell; short stump vein, costa slightly dilated; subcostal cell light brown.

FEMALE. Length 18 mm. Discal hairs of scutellum sparse black, subequal in length to antennal segment 2, 6 black marginal bristles. Abdominal segments 2-6 grayish pollinose on lateral and posterior margins and narrow base of 7; hairs white on sides and posterior margins 2-6, short black dorsally on 2-6, longer on 2-3. Sternites 1-6 gray pollinose and narrow base of 7, hairs erect white on 1-4, short on 5-6 with a few black on 6, 7 black with black hairs; ovipositor black, 3.7 mm. long, at middle 1/8 as long as wide.

ANOMALA GROUP

Hine (1919) says, "Three species belong to the group with three submarginal cells normally. They are all rather light colored and inhabitants of more or less arid regions. Coquillett has proposed the genus *Efferia* for the reception of these species, but usually it is considered a synonym of *Erax*. The furcation of the third vein occurs about midway between the base of the second posterior cell and the anterior cross vein. Costa not dilated."

The group as considered here contains several species with the basal segments of the abdomen brown or black and male segments 6 and 7 silvery pollinose; also in these species the third vein branches at or near the end of the discal cell. The greater number of species have the abdomen white or

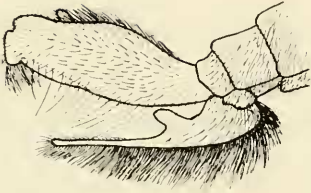
grayish pollinose and the males of most of them have long white parted hairs on three or more segments.

The presence of three submarginal cells is quite dependable, rarely is a specimen found with three cells in one wing and two in the other, and very rare are specimens with only two cells in both wings. Bromley (1951) in a lot of 103 specimens of *E. completa* (Macquart) all collected at the same time, found 97 with 3 submarginal cells in both wings, 3 with three submarginal cells in the right wing and 2 in the left, and only 1 with only two submarginal cells in both wings (2 specimens were not accounted for). James (1941) in reference to the *Anomala* Group says, "however, three submarginal cells occur as an abnormality in occasional specimens of other species, such as *E. barbatus*, *E. bicaudatus*, and *E. pallidulus*."

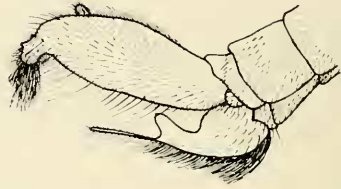
KEY TO THE SPECIES OF THE ANOMALA GROUP—MALES

1. Abdomen with long white parted hair directed outward on 3 or more segments 2
 Abdomen without long parted hair 10
2. Femora reddish posteriorly; usually larger flies, 25-32 mm. 3
 Femora black, at most narrowly reddish at the base or apex; smaller flies, 13 to 25 mm. 4
3. Abdominal segments 2-3 dark brown basally, 2-5 with long white parted hair becoming shorter on apical segments; bristles of palpi and occiput, and hairs on terminalia largely, black; 6-10 black scutellar bristles; fore femora 2/7 as wide as long; length 25-30 mm. (Arizona, Kansas, Mexico, New Mexico, Texas) *E. anomala* (Bellardi)
 Abdomen wholly silvery white pollinose, segments 2-5 with white parted hair which becomes shorter with each segment apically; bristles of palpi and occiput, and hairs of terminalia usually, largely white; normally 4 black scutellar bristles; fore femora 3/7 as wide as long; length 25-32 mm. (Arizona, New Mexico)
 *E. tricella* (Bromley)
4. Anterior branch of the third vein (R-4) ends in the second vein (R-2 + 3); terminalia usually yellowish red; abdominal segments 2-7 with white parted hair; length 13-19 mm. (Arizona, California) *E. azteci*, new species
 Anterior branch of the third vein ends in the costa; terminalia usually black 5
5. Scutellum with dense clumps of white hairs on either side of the disc, about 16 black marginal bristles; mystax with many black bristles, white hairs intermixed; abdominal segments 2-7 with white parted hairs decreasing in length on 4-7; length 21-24 mm. (California) *E. anacapai* (Wilcox and Martin)
 Scutellum with scattered hairs on the disc, usually not more than 8 marginal bristles; mystax wholly white 6
6. Terminalia dorsally black haired and usually some black hairs on lower margin of surstyli and in the fringe on lower forceps; scutellar and occipital bristles all or in part black 7
 Terminalia white haired, sometimes a few black hairs basally at middle of surstyli; scutellar and occipital bristles white 9
7. Parted white hairs on abdomen becoming progressively shorter from segment 2 to 5, short appressed white on 6-7; tail of lower forceps slender and as long as basal section; length 21-25 mm. (Kansas, New Mexico, Texas) *E. luna*, new species

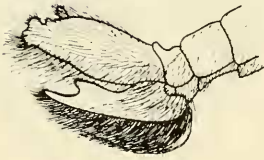




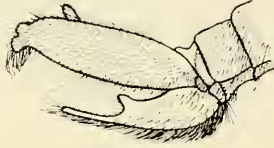
51. ANOMALA



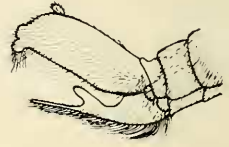
52. TRICELLA



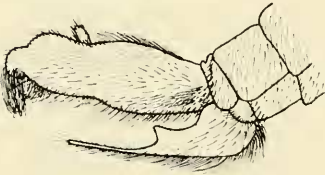
53. COMPLETA



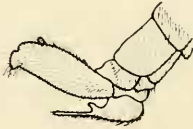
54. GILA



55. CANDIDA



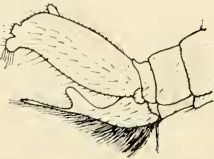
56. ANACAPAI



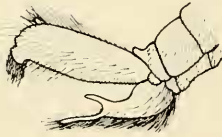
57. AZTECI



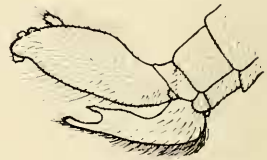
58. PERNICIS



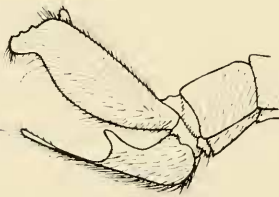
59. DAVISI



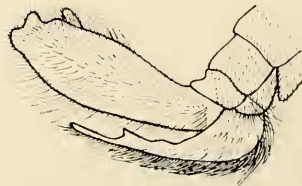
60. HALLI



61. BRYANTI



62. LUNA



63. ANTIOCHI

- Parted white hairs on abdominal segments 2-5 subequal in length, long appressed on 6-7 8
8. Hairs on the frons all or in part black; tail of lower forceps about 1/2 length of basal section; hairs on venter of abdominal segments 1-7 erect but becoming shorter apically; length 15-22 mm. (California) *E. halli*, new species
- Hairs on the frons white; tail of lower forceps about 2/3 length of basal section; venter of abdominal segments 1-5 with erect hairs, short on 6-7; length 21-24 mm. (Arizona) *E. gila*, new species
9. Ventral abdominal hairs all short, subequal in length to antennal segment 2; upper hairs in mystax subequal in length to antennal segments 1-2; length 16-21 mm. (Arizona, Mexico, New Mexico) *E. davisi*, new species
- Ventral hairs on abdominal segments 1-4 erect and at least as long as antennal segments 1-2; upper hairs in mystax as long as antennal segments 1-3; length 16-25 mm. (Arizona, Mexico, California) *E. candida* Coquillett
10. Abdomen uniformly gray pollinose; femora usually reddish at base and apex; anterior branch of the third vein usually ends in the second vein; 8-10 scutellar bristles, usually white; length 15-24 mm. (Arizona, California, Utah) *E. perniciis* Coquillett
- Abdominal segments 2-5 largely black, 6-7 densely white pollinose 11
11. Abdomen normally wholly black haired, sometimes with a few white hairs laterally on segments 1-3; terminalia black haired; femora black; length 16-20 mm. (Mexico, Texas) *E. completa* (Macquart)
- Abdomen with numerous white hairs laterally at least on segments 1-3; terminalia largely white haired 12
12. White hairs on abdomen confined to abdominal segments 1-3; femora usually reddish brown dorsally; length 17-24 mm. (Arizona) *E. bryanti*, new species
- Abdominal segments 1-4 with white hairs; femora wholly black; length 20-26 mm. (California) *E. antiochi*, new species

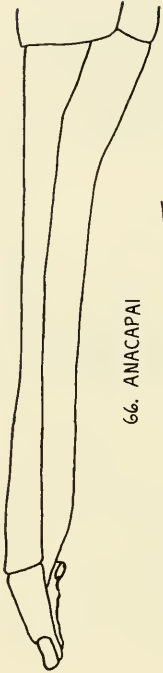
KEY TO THE SPECIES OF THE *ANOMALA* GROUP—FEMALES

1. Ovipositor 6.6 to 7.2 mm. long 2
- Ovipositor at most 5.4 mm. long 3

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FIGURES 51-63. *Anomala* Group, lateral views of the male terminalia of the *Efferia* species:

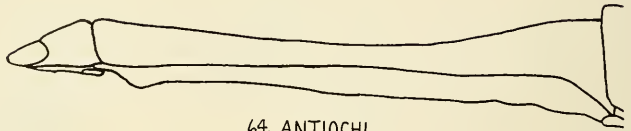
51. *E. anomala* (Bellardi).
 52. *E. tricella* (Bromley).
 53. *E. completa* (Macquart).
 54. *E. gila*, new species.
 55. *E. candida* Coquillett.
 56. *E. anacapai* (Wilcox and Martin).
 57. *E. azteci*, new species.
 58. *E. perniciis* Coquillett.
 59. *E. davisi*, new species.
 60. *E. halli*, new species.
 61. *E. bryanti*, new species.
 62. *E. luna*, new species.
 63. *E. antiochi*, new species.



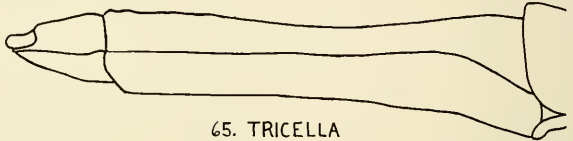
66. ANACAPAI



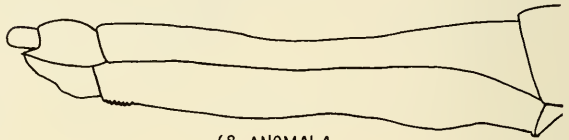
67. CANDIDA



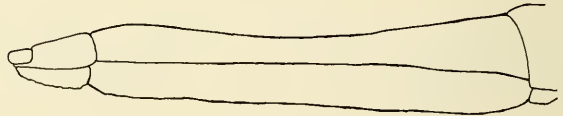
64. ANTIOCHI



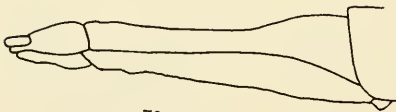
65. TRICELLA



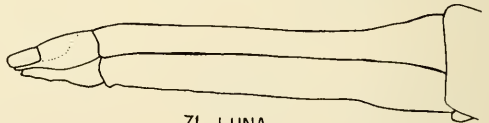
68. ANOMALA



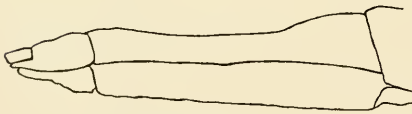
69. GILA



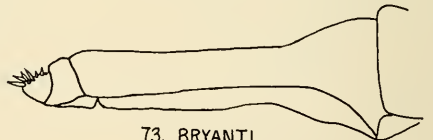
70. HALLI



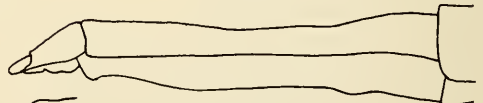
71. LUNA



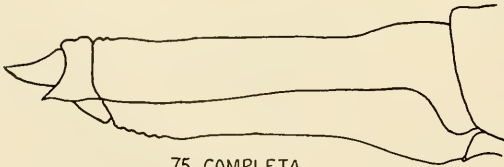
72. DAVISI



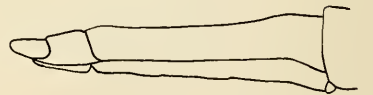
73. BRYANTI



74. PERNICIS



75. COMPLETA



76. AZTECI

2. Scutellum with dense clumps of white hairs laterally on the disc; ovipositor 7.2 mm. long *E. anacapai*
 Scutellum with sparse erect black and white hairs; ovipositor 6.6 mm. long .. *E. antiochi*
3. Anterior branch of the third vein ends in the second vein 4
 Anterior branch of the third vein ends in the costa 5
4. Base and apex of the femora reddish; ovipositor 4.5-5.0 mm. long *E. pernicious*
 Femora wholly black; ovipositor 2.5-3.0 mm. long *E. azteci*
5. Posterior side or dorsum off the femora reddish 6
 Femora wholly black 8
6. Dorsum of femora reddish; ovipositor 3.0-3.5 mm. long, with short spines on the tip *E. bryanti*
 Posterior side of femora reddish; ovipositor with hairs at tip 7
7. Abdomen wholly whitish pollinose; 4 scutellar bristles, white or black; palpi white haired; ovipositor 4.5-5.0 mm. long *E. tricella*
 Abdominal segments blackish basally; 8 black scutellar bristles; palpi black haired; ovipositor 4.5-5.0 mm. long *E. anomala*
8. Ovipositor forked at tip; anterior mesonotal hairs as long as antennal segments 1-2; ovipositor 3.5-4.0 mm. long *E. completa*
 Ovipositor not divided at tip; anterior mesonotal hairs not longer than antennal segment 2 9
9. Scutellar and occipital bristles white; abdomen densely white pollinose and white haired, segment 7 sometimes thinly pollinose and black haired dorsally 10
 Scutellar and occipital bristles all or in part black; abdomen white pollinose, segments 6-7 thinly pollinose and with black hairs at least dorsally 11
10. Venter of abdomen with all short white hairs; hairs above in mystax quite dense but not longer than antennal segment 1; ovipositor 3.7 mm. long *E. davisii*
 Venter of abdominal segments 1-3 with long erect hairs; hairs above in mystax dense and as long as antennal segments 1-2 or 1-3; ovipositor 3.6-3.7 mm. long .. *E. candida*
11. Discal hairs of scutellum as long as antennal segments 1-2; lateral hairs on the frons in part black; face 38/42 width of one eye; ovipositor 3.3 mm. long *E. halli*
 Discal hairs of scutellum not longer than antennal segment 2; lateral hairs on the frons white 12

←

FIGURES 64-76. *Anomala* Group, lateral views of the ovipositors of the *Efferia* species:

64. *E. antiochi*, new species.

65. *E. tricella* (Bromley).

66. *E. anacapai* (Wilcox and Martin).

67. *E. candida* (Coquillett).

68. *E. anomala* (Bellardi).

69. *E. gila*, new species.

70. *E. halli*, new species.

71. *E. luna*, new species.

72. *E. davisii*, new species.

73. *E. bryanti*, new species.

74. *E. pernicious* Coquillett.

75. *E. completa* (Macquart).

76. *E. azteci*, new species.

12. Fore and middle tibiae and tarsi reddish; face at antennae 42/52 width of one eye; ovipositor 4.2 mm. long *E. luna*
 Fore and middle tibiae at the tips and the tarsi black; face at antennae 48/53 width of one eye; ovipositor 5.4 mm. long *E. gila*

Efferia anacapai (Wilcox and Martin).

Erax anacapai WILCOX and MARTIN, 1945, Bull. South. Calif. Acad. Sci., vol. 44, p. 13.

Types male and female, Anacapa Island, California, 18 Aug. 1940 (C. Henne), LACM.

No additional material has become available. The dense clumps of white hairs on each side of the scutellum and the numerous black marginal bristles, separate this species readily from the others. The black bristles of the mystax intermingled with white hairs also separate it from most of the other species and the long slender ovipositor (7.2 mm. long) is only approached by *E. antiochi*, new species.

Efferia anomala (Bellardi).

Erax anomalus BELLARDI, 1861, Saggio di ditterologia messicana, vol. 2, p. 32, fig. 7.

Types male and female, Mexico, Turin, Italy.

Erax anomalus, WILLISTON, 1885, Trans. Amer. Entomol. Soc., vol. 12, p. 69.

Description of both sexes from Arizona.

Erax anomalus, OSTEN SACKEN, 1887, Biologia Centrali-Amer. Insecta. Diptera, vol. 1, p. 199. Description of both sexes from northern Sonora.

Erax anomalus, HINE, 1919, Ann. Entomol. Soc. Amer., vol. 12, p. 119. Description of both sexes from Kansas to Texas and Mexico and westward, figures of wing and male genitalia.

C. H. Martin says that this well known and well described species mainly from the Nearctic region is distinct from *E. anomala* (Bellardi) from Mexico.

Many specimens from *Arizona*: Apache, Cochise, Coconino, Gila, Graham, Maricopa, Pima, Santa Cruz, and Yavapai counties. *New Mexico*: Grant and Hidalgo counties. Collected from May to August but mostly taken in July. One specimen determined as belonging to this species with only two submarginal cells in the wings was seen with these data: Jesus Maria, Nayarit, *Mexico*, 6 July 1955 (B. Malkin).

Efferia antiochi Wilcox, new species.

MALE. Length 21 mm. Head brown, face and frons yellowish gray pollinose, occiput gray pollinose. Mystax white, yellowish below and with black hairs mixed throughout; face at antennae 40/45 width of one eye, vertex 34; hairs on frons black and white; black hairs and 2 strong bristles on ocellar tubercle; occipital bristles black with white hairs intermixed; beard and hairs on proboscis white; palpi black haired with several white below. Antennae brown, hairs black and white; segments measure 12-8-13-31.

Mesonotum black, yellowish gray pollinose, central stripe and intermediate area brown at some angles. Hairs black, anterior hairs on central

stripe longer than antennal segments 1-2, a few hairs on base of humeri and on anterior and lateral margins, white. Bristles black, 3 presutural, 2 supraalar, 3 postalar and 7 dorsocentral. Pleura and coxae grayish brown pollinose, hairs and bristles black and white, stronger hypopleurals black. Scutellum grayish brown pollinose, hairs black with a few white basally, about 10 black marginal bristles.

Abdomen black, segments 1-5 brown pollinose appearing black dorsally, 6-7 white pollinose. Segments 1-5 black haired with sparse white hairs laterally and posteriorly, 6-7 white haired. Venter 1-5 brown pollinose, 6-7 white; segment 1 white haired, 2-5 mostly black and 6-7 mixed black and white. Terminalia brown lateral hairs white, dorsal hairs on surstyli and long hairs on ventral margin black; lower forceps white haired, ventral fringe brown with a margin of white hairs, at base about 2 times length of antennae 1, gradually narrowing to $1/2$ length apically.

Femora black, fore and middle and basal half of hind tibiae reddish, tarsi brown. Hairs white; longer black below and above on femora, short black above on hind tibiae and middle and hind tarsi. Bristles black; claws black, reddish basally; empodia and pulvilli brownish.

Halteres brown. Wings hyaline, veins brown, anterior crossvein at $32/60$ length of discal cell, third vein branched opposite end of discal cell.

FEMALE. Length 26 mm. Black bristles confined to lower part of mystax and only upper occipitals black, those along the eye margins yellowish. Antennal hairs white. Presutural bristles mostly yellowish. Scutellar bristles half yellowish. Abdomen brown pollinose and white haired with short black hairs dorsally; venter white haired; ovipositor brown and black, 6.5 to 7 mm. long. Femora black, basal half of tibiae reddish, remainder of tibiae and tarsi brown.

HOLOTYPE. Male, Antioch, California, 30 September 1933 (B. J. Hall), CAS.

ALLOTYPE. Female, same locality, 16 September 1938 (B. Brookman), CAS.

PARATYPES. *California*: same locality, 1♂, 13 September 1936 (B. E. White), CAS, 2♂♂, 1♀, 20 September 1936 (M. A. Embury), CAS, 1♀, 1 October 1933, 1♂, September 1936, JW; 2♂♂, 9 September 1958 (J. R. Powers, R. W. Thorp), 1♂, 16 September 1934 (E. O. Essig), 2♀♀, 25 September 1959 (E. E. Linquist, R. W. Thorp), 1♂, 1♀, 26 September 1937 (K. D. Snyder), 3♀♀, 12, 13 October 1947 (P. D. Hurd, C. C. and U. N. Lanham), 1♂, 14 October 1954 (A. M. Barnes), 1♂, 3♀♀, 24 October 1948 (P. D. Hurd, W. W. Wirth), CIS, 5♂♂, 1♀, 15 September, 6 October 1935, 10 October 1936 (G. E. and R. M. Bohart), UCD, 1♀, 19 September 1936 (L. R. Jepson), 1♂, September 1936, UCR; 1♂, Fresno, 15 December 1954 (F. Thompson), 1♀, 24 October 1954 (G. Frymire),

2♀♀, Scout Island, San Joaquin River, 15 October 1953 (G. Wilson), CSCF.

Efferia azteci Wilcox, new species.

MALE. Length 14 mm. Head black, grayish white pollinose, face and frons with a golden tinge. Hairs and bristles white, ocellar tubercle with 2 long bristles and 2 hairs white and several black hairs posteriorly. Face at antennae 25/35 width of one eye, vertex 21. Antennae black, segments measure 12-6-14-20.

Mesonotum black, gray pollinose with a yellowish tinge, broadly separated central stripe and intermediate area appearing black at some angles. Central and intermediate area mostly with black hairs about as long as antennal segment 2; hairs short white otherwise except in the central row posteriorly where they are longer. Bristles white, 2 presutural, 2 supraalar and 2 postalar. Pleura and coxae gray pollinose with white hairs and bristles. Scutellum gray pollinose and long white haired with about 8 white marginal bristles.

Abdomen black, densely grayish white pollinose. Hairs white, long on segments 1-5, shorter on 6-7, parted on 2-7. Venter densely gray pollinose, hairs white, longer basally becoming shorter apically. Terminalia brown, in dorsal view about 1 1/2 times wider apically than at base; hairs white but short black above on surstyli; fringe on lower forceps white, sparse, about 1/2 length of antennae 1. Segment 8 gray pollinose and white haired.

Femora black, basal 3/4 of tibiae yellowish, apex of the tibiae and the tarsi brown. Hairs white, a few short black ones above on the femora. Bristles white except below on the tarsi. Claws black, base reddish; empodia and pulvilli brownish.

Halteres light brown, base brown. Wings hyaline, veins brown, anterior crossvein at 22/41 length of discal cell, third vein branched at 7/8 distance from anterior crossvein to end of discal cell, anterior branch of the third vein ends in the second vein.

FEMALE. Length 15 mm. Upper occipital bristles black. Longer hairs in the central row of the mesonotum at the suture and a few short hairs on humeri black. Abdomen grayish white pollinose, subshining black dorsally; hairs short white on 1-5 and sides of 6-7, short black dorsally on 6-7; white bristles laterally and posteriorly on 2 and posteriorly on 3-4; ovipositor black, 3.0 mm. long. Several of the longer tarsal bristles black. Anterior crossvein at 23/45 length of discal cell, third vein branched at 3/5 distance from anterior crossvein to end of discal cell.

HOLOTYPE. Male, Aztec, Arizona, 16 October 1962 (J. Wilcox), CAS.

ALLOTYPE. Female, same data.

PARATYPES. 19♂♂, 27♀♀, same data and 27 October 1962 (Itol J. and J. Wilcox); 1♂, 1♀, Ajo, Arizona, 10 September 1947 (Itol J. and J.

Wilcox); 1♀, 12 mi. N. of Coolidge, Arizona, 18 October 1962 (J. Wilcox); 3♂♂, Gila Bend, Arizona, 7 September 1947 (Itol J. and J. Wilcox); 1♂, Mohawk, Arizona, 25 August 1955 (J. Wilcox); 1♂, Organ Pipe National Monument, Arizona, 10 September 1947 (J. Wilcox); 1♀, Pima County, Arizona, October 1925 (R. A. Freeman); 1♂, 7 mi. N. of Sacaton, Arizona, 18 October 1962 (J. Wilcox); 3♂♂, 13♀♀, 8 mi. N. of Tucson, Arizona, 19 September to 20 October 1964 (Earl G. Davis); 2♂♂, 10 mi. N. of Tucson, Arizona, 10 October 1964 (Earl G. Davis); 2♂♂, 2♀♀, 12 mi. N. of Tucson, Arizona, 10 October 1964 (Earl G. Davis), CAS; 1♂, Parker, Yuma County, Arizona, 30 August 1961 (D. C. Rentz), CAS; 1♀, 9 mi. W. of Blythe, California, 11 October 1958 (J. W. MacSwain), 1♀, Hopkins Well, California, 11 October 1958 (R. W. Thorp), CIS; 1♂, 35 mi. N. of Yuma, Arizona, 2 October 1958 (T. R. Haig), 1♂, Picacho Pass, Pima County, Arizona, 13 September 1954 (J. C. Hall), 1♀, 10 mi. W. of Blythe, California, 12 October 1954 (J. C. Hall), UCD.

Efferia bryanti Wilcox, new species.

MALE. Length 20 mm. Head black, face and frons yellowish gray pollinose, occiput gray pollinose. Mystax white with a definite yellowish color except at tip, a few black hairs below and 4-5 long black bristles on the sides below; face at antennae 38/46 width of one eye, vertex 31. Hairs on frons black and white; ocellar tubercle with 5 black and 1 yellowish bristles; occipital bristles black above, yellowish along eye margins; beard, hairs of proboscis and below on palpi white, above on palpi black. Antennae black, hairs on segments 1-2 black and white; segments measure 15-7-18-27.

Mesonotum black, yellowish brown pollinose, posterior dorsocentral stripes and transverse suture gray. Hairs black, central crest anteriorly not longer than antennal segments 1-2 but becomes longer posteriorly; hairs anteriorly and laterally and about half on humeri white. Bristles black, 3 presutural, 2 supraalar, 3 postalar. Pleura and coxae brownish pollinose; hairs white, a few on sterno- and mesopleura black; bristles on fore and middle coxae reddish, on hind coxae black; long slender hypopleurals black. Scutellum grayish brown pollinose, basal hairs white becoming longer and black apically; about 8 black marginal bristles.

Abdomen black, segments 1-5 brownish pollinose, the dorsum appearing black; 6-7 white pollinose. Segments 1-5 dorsally mostly black haired, 1-3 with white hairs laterally and posteriorly, 4-5 with a few short white hairs; venter 1-3 mostly long black haired, 4 mostly short black and 5 mostly short white; 6-7 short white haired dorsally and ventrally. Surstyli black, short white haired, black hairs dorsally and sparse long black and white hairs on ventral margin. Lower forceps brownish black, hairs white, ventral fringe black with a few marginal white hairs, subequal in length to antennae 1.

Segment 8 grayish pollinose, hairs white, posterior row on sternite short and sparse.

Legs black, femora dorsally, basal $3/4$ of fore and basal half of middle tibiae brown. Bristles black. Hairs on femora white with scattered black hairs above and below; tibia white haired with sparse fine black hairs ventrally; fore tarsi mostly white haired, middle and hind tarsi mostly black haired. Claws black, reddish basally; empodia and pulvilli, light brown.

Halteres brown. Wings hyaline, veins black, anterior crossvein at $32/59$ length of discal cell, third vein branched at $2/3$ distance between anterior crossvein and end of discal cell.

FEMALE. Length 19 mm. Mystax white, 4-7 black hairs on sides and a number of black hairs below. Antennae mostly white haired. Three yellowish and 2 black bristles on ocellar tubercle. Occipital bristles yellowish, 3 on each side above black. Bristles on coxae yellow. Six black scutellar bristles, discal hairs sparse and shorter, mostly white. Abdominal segments 1-7 black haired dorsally, 2-4 with a few black hairs ventrally; ovipositor black, small spines at tip brown. Anterior crossvein at $25/49$ length of discal cell, third vein branched at $4/5$ distance from anterior crossvein to end of discal cell.

HOLOTYPE. Male, Madera Canyon, Arizona, 4,000 feet, 23 September 1962 (J. Wilcox), CAS.

ALLOTYPE. Female, same data.

PARATYPES. 42 ♂♂, 19 ♀♀, same locality, 13, 14, 23, 24 September, 26 October 1962 (Itol J. and J. Wilcox); 1 ♂, Baboquivari Mountains, Arizona, 23 September 1933 (Owen Bryant) lot 413, 3 ♂♂, 1 ♀, 27 September 1936, 6 October 1933 (F. H. Parker), 2 ♀♀, September (D. K. Duncan); 1 ♀, Nogales, Arizona, 2 November 1937 (C. C. Deonier); 8 ♂♂, Pepper Sauce Canyon, Santa Catalina Mountains, Arizona, 29 September 1964 (Earl G. Davis); 1 ♀, Sierra Ancha Mountains, 29 September 1957 (Ivan Jennings), ASU; 4 ♂♂, 12 ♀♀, Sierritas Mountains, Arizona, 25 November, 8 December 1962 (Earl G. Davis, J. Wilcox); 4 ♂♂, 9 ♀♀, 7 mi. N. of Tucson, Arizona, 18 October 1964 (Earl G. Davis); 1 ♀, Tucson, Arizona, Desert Museum, 12 November 1962 (Earl G. Davis).

Named in honor of the late Owen Bryant who collected many species of robber flies, especially in Arizona.

***Efferia candida* Coquillett.**

Efferia candida COQUILLET, 1893, Canad. Entomol., vol. 25, p. 176. Types male and female, Los Angeles County, California, USNM.

Hine (1919) gives a description which includes several species and his figure of the male genitalia appears closest to *E. tricella*.

Specimens are known from the following localities: *Arizona*: Yuma, 17 April 1941 (J. Wilcox); 10 mi. E., 30 April 1962 (J. Wilcox); 16 mi. E., 17 April 1941 (N. R. Anderson; and Joe Jr., and J. Wilcox). *California*: 11 mi. S. of Adelanto, 5 August 1957 (J. Wilcox); Agua Caliente Springs, 26 August 1947 (J. Wilcox); 15 mi. S. of Bakersfield, 12 June 1921 (C. D. Duncan) 302; 15 mi. E., 4 July 1946; 6 mi. E. of Banner, 26 June 1963 (J. Powell); Banning, 16 July 1950 (P. D. Hurd, J. W. MacSwain, R. Schuster); Beaumont, 24 August 1941 (Dan F. and Guy F. Toland, J. Wilcox); Big Pine, 11 July 1953 (J. W. MacSwain); Cabazon, 19 June 1949 (J. Wilcox); Castaic, 24 August 1941 (J. Wilcox); Coachella Valley, 9 May 1927, 21, 22 May 1928 (E. C. Van Dyke); Devils Canyon, May 1932 (H. Gentry); Deep Canyon, Riverside County, 5 September to 9 October 1963, 1964 (M. E. Irwin, E. I. Schlinger); East Highlands, 24 September 1923 (F. R. Cole); Indio, 19 September 1946 (J. Wilcox); Kane Springs, 28 August 1947 (J. Wilcox); 3 mi. N. of Lone Pine, 8 July 1961 (H. V. Daly); Mint Canyon, 31 July 1935 (E. I. Beamer); Oasis, 10 mi. S., 6 September 1947 (J. Wilcox); Palm Springs, 21, 28, 31 May 1943 (Guy F. Toland, J. Wilcox), 22 May 1917 (E. P. Van Duzee); Palo Verde, 15 September 1961 (P. D. Hurd); Rialto, 15 August 1956 (E. G. Linsley); Riverside, 30 June to 9 August 1927, 25 May 1928 (P. H. Timberlake); White Mountains, 5 July 1959 (J. Wilcox); White Water, 9 July 1950 (J. W. MacSwain), prey, green buprestid. *Mexico*: 83 klm. S. of Organ Pipe National Monument, 21 April 1947 (A. L. Melander).

***Efferia completa* (Macquart).**

Erax completus MACQUART, 1838, *Diptera exotique nouveaux ou peu connus*. Paris. Vol. 1, no. 2, p. 117. Type male, N. A., Paris Mus. ?

Efferia rava COQUILLET, 1893, *Canad. Entomol.*, vol. 25, p. 176. Type, female, Texas (Morrison), USNM.

Erax completus, BROMLEY, 1951, *Amer. Mus. Novitates*, no. 1532, p. 29.

"Common in the Rio Grande valley and southwestern Texas in September and October. —distinguished from *rufibarbis* Macquart by the broader, larger, more bulbous genitalia, more thickly hirsute with black hairs, the pale yellowish, almost white mystax and beard, and the presence of three submarginal cells. The female has most of the scutellar bristles pale, with black hairs on the disc. The presence of the three submarginal cells is not invariable, but it is the rule; whereas in *rufibarbis* the presence of three submarginal cells is exceptional."

Hine (1919), Martin (1962), and Martin and Wilcox (1965), consider this species to be a synonym of *E. pogonias* Wiedemann (*E. rufibarbis* Macquart).

In dorsal view the surstyli are about 1 1/2 times as broad apically as near the base and have dense long black hairs apically and on the ventral margin (*E. pogonias* not broader at apex than at base, hairs sparse and ventral margin with about 12 long bristle-like hairs): ♂ sternites 4-5 with short rather

dense black hairs (*E. pogonias* with erect sparse black or white hairs). Scutellar bristles vary in both sexes and in both species. Wings hyaline (*E. pogonias* with yellow along the veins in the eastern specimens which is not evident in specimens from Texas).

Specimens from the following localities in *Texas*: Bexar County, 13 October 1931 (H. B. Parks); Dimmit County, 28 October 1933 (S. E. Jones); Pearsall, 6 to 13 October 1934 and 9, 10 November 1935.

Efferia davis Wilcox, new species.

MALE. Length 18 mm. Head black, white pollinose; hairs and bristles white; face at antennae 35/42 width of one eye, vertex 28. Antennae brown, segments measure 15-8-17-28.

Mesonotum black, gray pollinose, central stripe and intermediate area brown. Hairs on central stripe and intermediate area black, shorter than antennal segment 2; hairs anteriorly and on humeri, lateral and posterior margins, short white, in central area posteriorly long white. Bristles white, 2 presutural, 2 supraalar, 2 postalar, 2 posterior dorsocentral. Pleura and coxae gray pollinose, hairs and bristles white. Scutellum gray pollinose, hairs white and about half length of bristles, 5 white marginal bristles.

Abdomen black, dorsum of segments 1-2 gray pollinose, 3-7 and venter densely white pollinose. Hairs white, parted on 2-7 becoming shorter apically. Venter 1-3 with short hairs about as long as antennal segment 1, shorter on remainder. Terminalia black; hairs white, short black on dorsum of surstyli; fringe dense, at base 2 times length of antennae 1, apically subequal in length to antennae 1.

Femora black, basal 4/5 of tibiae yellowish red, tips of tibiae and tarsi brown. Hairs white, hind tarsi above in part black haired. Bristles black and white, those on fore and middle tarsi mostly white. Claws black, base reddish; empodia and pulvilli, light brown.

Halteres brown. Wings hyaline, veins brown, anterior crossvein at 31/60 length of discal cell, third vein branched at 2/3 distance from anterior crossvein to end of discal cell.

FEMALE. Length 19 mm. Discal hairs on scutellum about 1/3 length of bristles. Abdominal segments 1-6 and sides of 7, grayish white pollinose, dorsum of 7 subshining black; hairs short white, black dorsally on 7. Venter grayish white pollinose, segment 1 bare, 2-7 with short white hairs; ovipositor black, 3.5 mm. long. Bristles of femora white.

HOLOTYPE. Male, 12 mi. N. of Sasabe, Arizona, 5 August 1962 (Itol J. Wilcox), CAS.

ALLOTYPE. Female, same data.

PARATYPES. 12 ♂♂, 19 ♀♀, same data (Earl G. Davis, Itol J. and J. Wilcox), JW. *Arizona*: 1 ♀, Ajo, 10 September 1947 (J. Wilcox), JW; 3 ♂♂, 1 ♀, Aztec, 7 August, 11 September 1962 (J. Wilcox), JW; 1 ♂, Benson,

June (D. K. Duncan), JW; 2 ♀♀, Chiricahua Mountains, July (D. K. Duncan), JW; 5 ♂♂, 5 ♀♀, Florence, 15 August 1948 (Itol J. and J. Wilcox), JW; 3 ♂♂, Granite Reef Dam, Maricopa County, 9, 28, 29 August 1964 (J. M. Davidson, Jim Haddock), ASU; 3 ♀♀, Hayden, 12, 14 August 1948 (J. Wilcox), JW; 1 ♂, Higley, 17 July 1917 (E. G. Holt), JW; 2 ♀♀, Huachuca Mountains, June, July (D. K. Duncan), JW; 1 ♀, 28 July 1907 (J. S. Hine), JW; 1 ♀, Mohawk, 29 August 1955 (J. Wilcox), JW; 1 ♂, 3 ♀♀, Mammoth, 14 August 1948 (J. Wilcox), JW; 1 ♂, Mustang Mountain, 22 August 1935 (E. I. Beamer), JW; ♂, Oracle Junction, 14 August 1948 (J. Wilcox), JW; 2 ♂♂, Phoenix, August (D. K. Duncan), CAS, JW; ♂, ♀, 12 mi. N. Pomerene, 14 July 1962 (J. Wilcox), JW; 2 ♂♂, Portal, 11, 20 July 1964 (J. H. Puckle, M. A. Mortenson, M. A. Cazier), ASU; 3 ♂♂, 1 ♀, 2 mi. N.E. of Portal, 11 July 1962 (Itol J. and J. Wilcox), JW; 2 ♂♂, 4 mi. E. of Portal, 26 June 1964, 10 July 1962 (J. H. Puckle, J. Wilcox), ASU, JW; 12 ♂♂, 14 ♀♀, 7 mi. E. of Portal, 10 July 1962, 23, 24 July 1964 (M. A. Cazier, M. A. Mortenson, Art Raske, Itol J. and J. Wilcox), ASU, JW; 1 ♂, 1 ♀, Pomerene, 14 July 1962 (J. Wilcox), JW; 1 ♀, Sabino Canyon, 9 September 1947 (Itol J. Wilcox), JW; 1 ♂, 3 ♀♀, Salome, 1 September 1947 (Guy F. Toland, J. Wilcox), JW; 2 ♂♂, 2 ♀♀, Santa Rita Mountains, 18 August 1935 (E. I. Beamer), JW; 2 ♂♂, 4 ♀♀, Sentinel, 12 August 1940, 7 September 1947 (E. C. Van Dyke, J. Wilcox), CAS, JW; 1 ♀, Sierritas Mountains, 20 July 1962 (Earl G. Davis), JW; 1 ♂, Tucson, 13 July 1932 (E. D. Ball), JW; 5 ♂, 3 ♀, Wenden, 17, 20 August 1947 (A. F. Howland), 17 August 1948 (J. Wilcox), JW; 1 ♂, Wickenburg, 1 September 1947 (Guy F. Toland), JW; 1 ♀, Willcox, 14 August 1958 (J. W. MacSwain), CIS; 1 ♂, 2 mi. S.E., 7 July 1962 (J. Wilcox), JW. *Nevada*: Las Vegas, 21 July 1933 (G. P. Engelhardt), JW. *New Mexico*: 2 ♀♀, 11 mi. S. of Animas, 27 July 1963 (M. A. Cazier, M. A. Mortenson), ASU; 1 ♀, Red Rock, 24 July 1932 (R. T. Kellogg), JW; 1 ♀, Rodeo, 1 August 1958 (P. M. Marsh), UCD; 20 ♂♂, 44 ♀♀, 1 pair, 1 mi. N. of Rodeo, 9 June to 25 August 1964, 26, 28 July 1963 (M. A. Cazier, M. A. Mortenson, J. H. Puckle, Art Raske, J. Wilcox), ASU, JW; 4 ♂♂, 4 ♀♀, 2 mi. N.W. of Rodeo, 7 to 18 July 1964, 26 July 1963 (M. A. Cazier, M. A. Mortenson, J. H. Puckle), ASU; 3 ♂♂, 2 ♀♀, 13 mi. N.E. of Rodeo, 5, 13 July 1964 (J. H. Puckle, M. A. Mortenson, M. A. Cazier), ASU; 2 ♀♀, 13 mi. N.W. of Lordsburg, 8 August 1959 (L. A. Stange, A. S. Menke), UCD.

Named for my friend and associate, Earl G. Davis of Tucson, Arizona, who has collected a large number of robber flies for me.

Efferia gila Wilcox, new species.

MALE. Length 23 mm. Head black, densely grayish white pollinose; hairs and bristles white, upper occipital bristles and 1 on ocellar tubercle

black. Mystax formed of a row of oral bristles with long hairs above, the upper ones longer than antennal segments 1-2; face at the antennae 45/51 width of one eye, vertex 38. Antennae black, hairs white, segments measure 16-9-16-34.

Mesonotum black, grayish pollinose, the broadly divided central stripe distinctly and the intermediate spots indistinctly, brown. Anterior hairs semi-erect black, in part on humeri and laterally behind suture white; longer erect hairs in posterior dorsocentral rows black and white. Bristles black, 2 presutural, 1 supraalar, 2-3 postalar. Pleura and coxae grayish white pollinose, hairs and bristles white. Scutellum grayish white pollinose, 4 black marginal bristles, erect hairs about as long as antennal segment 1, black and white.

Abdomen black, segments 1-7 densely white pollinose; hairs white, parted on 2-5, long appressed on 6-7; long sparse erect on venter 1-4, short on 5-7. Segment 8 and terminalia black, hairs white, dorsum of surstyli and the apical tuft black and about half of the fringe on lower forceps black, subequal in length to antennae 1.

Femora black, basal 2/3 of tibiae yellowish red, tips and tarsi brown. Hairs white, on hind tarsi mostly black. Bristles black, about half white on fore and middle tarsi. Claws black, reddish basally; empodia and pulvilli brown.

Halteres light brown. Wings hyaline, veins brown, anterior crossvein at 40/70 length of discal cell, third vein branched slightly before discal crossvein.

FEMALE. Length 25 mm. Bristles of head all white; 1 of 6 scutellar bristles black. Abdomen white pollinose, dorsum of 6-7 largely subshining black; hairs short white, longer on sides of 1-2; dorsum of 6-7 largely short black haired; ovipositor black, 5.4 mm. long. Bristles on femora and tibiae in part white; middle tarsi largely black haired.

HOLOTYPE. Male, San Carlos, Arizona, 13 August 1948 (J. Wilcox), CAS.

ALLOTYPE. Female, same data.

PARATYPES. 3♂♂, same data, 1♂, same locality, August (D. K. Duncan); ♂, 2♀♀, Baboquivari Mountains, El Oro Mine, 4,000 feet, 16, 18 July 1932 (D. K. Duncan); 6♂♂, 1♀, Globe, Arizona, August (D. K. Duncan); 2♂♂, 2♀♀, Mammoth, Arizona, 14 August 1948 (J. Wilcox); 2♂♂, 5♀♀, Rice, Arizona, August (D. K. Duncan); all JW.

Efferia halli Wilcox, new species.

MALE. Length 17 mm. Head black, grayish white pollinose. Hairs and bristles white; hairs laterally on frons, 2 bristles and longer hairs on ocellar tubercle, and upper occipital bristles black. Face at antennae 36/41 width

of one eye, vertex 32. Antennae black, hairs white, segments measure 11-5-13-31.

Mesonotum black, brownish pollinose: humeri, suture and postalar area, grayish. Hairs black, anteriorly on central stripe longer than antennal segment 2; some white hairs on humeri and on all margins. Bristles black, 2 presutural, 1 supraalar, 2 postalar, 2 posterior dorsocentral. Pleura and coxae grayish pollinose, hairs and bristles white. Scutellum grayish pollinose, hairs white and $2/3$ as long as bristles, 4 black and 1 white marginal bristles.

Abdomen black, grayish white pollinose. Hairs long white, parted on segments 2-7 gradually becoming shorter apically. Venter gray pollinose, hairs white, long on 1-4, shorter on 5-7. Terminalia black; lateral hairs white on surstyli, rather long black dorsally, and numerous longer black hairs apically and on ventral margin; lower forceps white haired laterally and ventrally at base, fringe brown, subequal in length to antennae 1, slightly longer basally.

Femora black, basal $2/3$ of tibiae yellowish red, tips of tibiae and tarsi brown. Hairs white. Bristles mostly white on fore and middle femora and tibiae, mostly black on tarsi and hind femora and tibiae. Claws black, base reddish; empodia and pulvilli brown.

Halteres brown. Wings hyaline, veins brown, anterior crossvein at $29/54$ length of discal cell, third vein branched at $2/3$ distance from anterior crossvein vein to end of discal cell.

FEMALE. Length 16 mm. Anterior mesonotal hairs slightly shorter than antennal segment 2. Discal hairs on scutellum about $1/2$ length of the 4 black marginal bristles. Abdominal segments 1-5 grayish white pollinose, 6-7 thinly so, subshining black; 2-5 short white haired and laterally on 6-7, dorsum of 6-7 and a few on 5 at middle, black; venter grayish white pollinose, hairs white, long on 1-3; ovipositor black, 3.5 mm. long. Fore and middle femora and tibiae with mostly black bristles. Anterior crossvein at $26/52$ length of discal cell, third vein branched $3/4$ distance from anterior crossvein to end of discal cell.

HOLOTYPE. Male, Oak Grove, California, 1 June 1941 (Guy F. Toland), CAS.

ALLOTYPE. Female, same data.

PARATYPES. 31 ♂♂, 44 ♀♀, same data (Thelma, Dan F. and Guy F. Toland, John and J. Wilcox), JW. *California*: 1 ♀, Anza, 5 July 1956 (B. M. Bartosh), UCD; 4 ♂♂, 4 ♀♀, Bear Valley, Holcomb Valley, 27 June 1948 (Guy F. Toland, J. Wilcox), JW; 1 ♀, Barton Flat, 22 June 1958 (H. R. Moffitt), UCD; 1 ♂, near Buckman Springs, San Diego County, 11 June 1953 (F. X. Williams), CAS; 1 ♂, 4 mi. N. of Cajon Junction, San Bernardino County, 1 July 1958 (J. C. Hall), UCD; 1 ♀, Guatay, 4 July 1958 (R. W. Bushing), UCD; 1 ♂, ♀, Hemet Reservoir, San Jacinto Mountains, 13 July 1939, 14 June 1940, CIS; 1 ♂,

1 ♀, Herkey Creek, San Jacinto Mountains, 14 June 1940 (D. Raski), CAS; 1 ♀, Idyllwild, 24 June 1928 (E. C. Van Dyke), CAS; 1 ♂, 1 ♀, Idyllwild, San Jacinto Mountains, Riverside County, 27 July 1953 (W. J. and J. W. Gertsch), AMNH; 4 ♂, 3 ♀, Keen Camp, San Jacinto Mountains, 10 June 1939, 23 June 1952 (H. Graham, W. C. Bush, E. S. Ross), CIS; 1 ♂, San Diego, 16 June 1913 (E. P. Van Duzee), CAS; 6 ♂ ♂, 3 ♀ ♀, San Bernardino Mountains, 9,000 feet, S.E. San Bernardino County, 30 July 1930 (Hall and Hall), JW; 8 ♂ ♂, 2 ♀ ♀, South Fork Forest Camp, San Bernardino County, 6,300 feet, 3 July 1942, 27 July 1941 (Guy F. Toland, J. Wilcox), JW; 1 ♂, Warner Springs, 4 July 1962 (J. Wilcox), JW; 1 ♂, 9 mi. S. of Warner Springs, 8 July 1956 (R. C. Bechtel), UCD.

Named in honor of David G. Hall (Hall and Hall, above) who was one of the first to collect this species and who gave me all the robber flies he collected in southern California years ago when specimens from California were scarce in my collection.

***Efferia luna* Wilcox, new species.**

MALE. Length 20 mm. Head black, grayish white pollinose; hairs and bristles white, 2 occipitals on one side black. Face at antennae 37/45 width of one eye, vertex 33. Antennae black, hairs white, segments measure 14-8-15-29.

Mesonotum black, grayish brown pollinose, broadly divided central stripe brown. Hairs short black, all margins with short white hairs; posterior dorsocentral hairs long black and white with 2 weak black bristles. Bristles black, 2 presuturals (1 whitish), 1 supraalar, 2 postalar. Pleura and coxae grayish white pollinose, hairs and bristles white. Scutellum grayish white pollinose, hairs white and about as long as antennal segment 1, 4 black marginal bristles.

Abdomen black, segments 1-7 white pollinose, 2-5 with white parted hair gradually becoming shorter apically, 6-7 with appressed white hairs; venter 1-3 with erect white hairs, 4-7 with short white hairs. Segment 8 and terminalia black, hairs white, dorsum of surstyli with short black hairs and ventral apical margin with 3-4 long black hairs; fringe about 1/2 length of antennae 1 with a tuft of longer hairs basally.

Femora black, reddish apically; tibiae yellowish red, tips and tarsi yellowish brown. Hairs white, short black dorsally on hind tarsi; bristles black, partly white on fore and middle tarsi. Claws black, base reddish; pulvilli and empodia light brown.

Halteres brown. Wings hyaline, veins brown, anterior crossvein at 36/65 length of discal cell, third vein branched slightly before discal crossvein.

FEMALE. Length 24 mm. Bristle of head all white. Five black scutellar bristles; 3-4 black posterior dorsocentral. Abdomen white pollinose, dorsum

of 7 subshining black; hairs short white, longer on sides of 1-2, dorsum of 7 with short black hairs; venter 1-4 with sparse erect white hairs; ovipositor 4.2 mm. long. Bristles of femora and tibiae in part white. Anterior cross-vein at 43/74 length of discal cell, third vein branched at 20/35 distance from anterior to discal crossvein.

HOLOTYPE. Male, Luna County, New Mexico, 30 July 1932 (R. T. Kellogg), CAS.

ALLOTYPE. Female, same data.

PARATYPES. 2♀, same data, JW. *New Mexico*: 1♂, Albuquerque, 5,000 feet, 26 June 1931 (Don Prentiss), JW; 3♂♂, 3♀♀, Dona Ana County, 5 August 1932 (R. T. Kellogg), JW; 2♂♂, 1♀, Malaga, 11 July 1936 (R. H. Beamer), JW; 1♀, Silver City, 24 June 1933 (R. T. Kellogg), JW. *Kansas*: 1♂, Stanton County, 3,000 feet, 30 July 1911 (F. X. Williams), JW. *Texas*: 1♂, 20 mi. S. of Alpine, 12 May 1927 (J. O. Martin), CAS; 1♀, Big Bend, 7 July 1931 (G. P. Engelhardt), JW.

Efferia pernicis Coquillett.

Efferia pernicis COQUILLETT, 1893, *Canad. Entomol.*, vol. 25, p. 175. Types male and female, Los Angeles and San Diego counties, California, USNM.

Erax pernicis, HINE, 1919, *Ann. Entomol. Soc. Amer.*, vol. 12, p. 120. Short description, figure of male genitalia, records from Arizona and California.

Specimens are known from the following areas. *Arizona*: Gila, Maricopa, Pima, Pinal, and Yuma counties. *California*: Imperial, Los Angeles, Orange, Riverside, San Bernardino, and San Diego counties. *Utah*: Washington county. Collected from May to September 1 but most specimens taken in June and July.

The anterior branch of the third vein usually ends in the second vein. The femora are usually reddish at the base and apex, specimens from the desert taken in July and August frequently have the posterior side of the femora reddish, and specimens from near the ocean may have the femora wholly black. The uniformly gray pollinose abdomen without parted hairs in the males and the rather long ovipositor of the females serve to separate this from the related species.

Efferia tricella (Bromley).

Erax tricellus BROMLEY, 1951, *Amer. Mus. Novitates*, no. 1532, p. 32. Type male, Buckeye, Arizona, June 25, 1925 (S. W. Bromley); female, Salome, Arizona, July 20, 1948 (W. Goslin), USNM. Paratypes from a number of other areas in Arizona and Deming, New Mexico.

Common in the southern half of Arizona and southwestern New Mexico. Specimens from the following areas, *Arizona*: Cochise, Maricopa, Pima, Pinal, Santa Cruz, and Yuma counties. *New Mexico*: Grant and Hidalgo counties. Collected from May to September but most material collected in June and July.

The figure of the male genitalia of *E. candida*, Hine 1919, appears to be that of this species as does his description in part at least.

The white parted hair on the male abdomen is longest on segment 2 and becomes shorter on each following segment, on 6-7 it is short recumbent and cannot be called parted. The head, neck, pleura, and coxae are largely reddish in ground color, the mesonotum is reddish in ground color except the black central and intermediate stripes, and the posterior side of the femora (which are stouter than in most species as indicated in the key). *E. anomala* specimens may have all these areas reddish in ground color but usually only the humeri are plainly reddish on the dorsum of the thorax.

ARIDA GROUP

Hine 1919 defines his Aridus Group as follows: "A few species from the more or less arid regions of western United States are much like members of the Stramineus group, but the branching of the third vein is almost exactly opposite the base of the second posterior cell."

This group is more likely to be confused with the Pogonias Group as the males of most species have abdominal segments 1-5 blackish and 6-7 silvery white. In the Arida Group the mystax is composed entirely or almost entirely of hairs while in the Pogonias Group there is a row of strong bristles on the oral margin. Even in the females a question may develop, as it is not always easy to tell whether the cerci are split at the tip or not. In the Arida Group the cerci are rounded apically and tergite 9 is usually longer than the cerci. In the Pogonias Group the cerci are pointed apically and are longer than tergite 9 dorsally.

The males of the western species which are similar to the males of the Pogonias Group can be separated by the largely white bristles of the legs, especially of the tarsi, they are black or largely so in the Pogonias Group. The Arida Group for the most part comes out in the spring while the Pogonias Group comes out in the fall.

The branching of the third vein may be slightly before, opposite or beyond the base of the second posterior cell (discal crossvein).

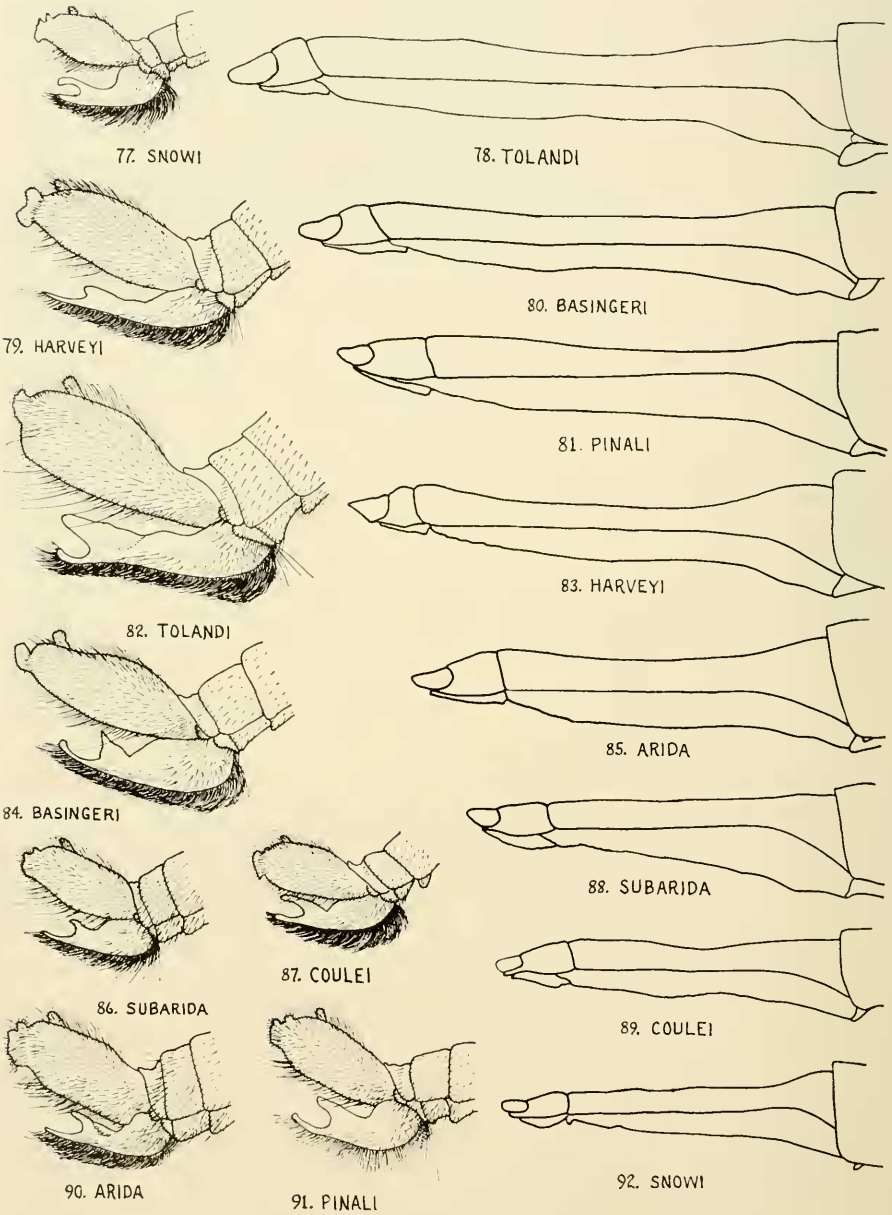
KEY TO THE SPECIES OF THE ARIDA GROUP—MALES

1. Abdominal segments 4-7 silvery pollinose, segment 4 with white parted hairs; bristles of tarsi usually black 2
 At most abdominal segments 5-7 silvery pollinose, without white parted hairs on any segments; bristles of tarsi white 3
2. Mystax yellowish, sometimes with some black hairs below on the sides; abdominal segments 1-3 black haired, tergite 8 brownish pollinose and sternite 8 with a dense fringe of brown hairs apically; length 15-23 mm. (Colorado, Kansas, New Mexico, Texas) *E. snowi* (Hine)
- Mystax white, about 3 black bristles and some black hairs below on the sides; abdominal segments 1-3 largely white haired, tergite 8 polished brown or black and

- sternite 8 with a sparse fringe of white hairs; length 13-17 mm. (Washington) *E. coulei*, new species
3. Mystax with many black hairs on the sides and below, white centrally 4
 Mystax white, the black hairs if any below 6
4. Wings tinged with yellow along the veins, third vein usually branched before the end of the discal cell; hairs above on the antennae black; fringe on the lower forceps sparse; length 18-26 mm. (Arizona) *E. pinali*, new species
 Wings hyaline, third vein usually branched beyond the end of the discal cell; hairs above on the antennae white; fringe on lower forceps dense 5
5. Legs black; scutellar bristles usually white, discal hairs subequal in length to the bristles; surstyli dorsally with black hairs; length 16-26 mm. (California, Nevada, Utah) *E. arida* (Williston)
 Basal half or more of the tibiae reddish; scutellar bristles usually all black, discal hairs 2/3 length of bristles; surstyli white haired, sometimes a few black dorsally; length 14-22 mm. (Arizona, New Mexico) *E. subarida* (Bromley)
6. Surstyli from dorsal view of nearly uniform width 7
 Surstyli from dorsal view nearly twice as wide apically as at the base 11
7. Abdomen white haired, at most a few black hairs at base of segments 1-3; antennae and humeri white haired 8
 Dorsum of abdominal segments 1-3 broadly black haired; antennae and humeri in part black haired 10
8. Abdominal segments 5-7 white pollinose; pulvilli 20/35 length of the claws; length 19-23 mm. (Arizona) *E. apache*, new species
 Abdominal segments 6-7 white pollinose; pulvilli 26/36 length of the claws 9
9. Abdominal segments with a few black hairs basally; mesonotal crest formed entirely of hairs; tooth on the lower forceps acute; length 24-25 mm. (California, Nevada) *E. basingeri*, new species
 Abdomen white haired; mesonotal crest formed mainly of bristles; tooth on lower forceps rounded apically; length 19-29 mm. (British Columbia, California, Oregon, Washington) *E. harveyi* (Hine)
10. Abdominal segments 1-3 and 4 in part with black hairs, longer at the sides; venter white haired; length 22 mm. (Utah) *E. subpilosa* (Schaeffer)
 Dorsum of abdominal segments 1-3 black haired, long hairs on sides white; venter of abdominal segments 2-4 largely black haired; length 20-31 mm. (California) *E. tolandi*, new species
11. Legs, abdominal segments 3-7 and genitalia, red; vestiture of mesonotum and scutellum white; leg bristles black; length 10-12 mm. (New Mexico) *E. cuervana* (Hardy)
 Femora black, tibiae and tarsi pale brownish, abdomen and genitalia black; mesonotum black haired; leg bristles in part pale; length 16 mm. (Texas) *E. prattii* (Hine)

KEY TO THE SPECIES OF THE *ARIDA* GROUP—FEMALES

1. Legs red; abdomen reddish brown *E. cuervana*
 Femora and abdomen black 2
2. Ovipositor 5.5 mm. long or longer 3
 Ovipositor 4.5 mm. long or less 7
3. Mystax with many black hairs below and on the sides; scutellar bristles black; ovipositor 5.5 mm. long *E. pinali*
 Mystax at most with a few black hairs below; scutellar bristles largely white 4



4. Ovipositor slender, about 1/10 as wide as long at the middle 5
Ovipositor broader basally, about 1/7 as wide as long at middle 6
5. Abdominal segments 2-7 usually white haired, venter 1-5 with fine erect hairs; pul-
villi 20/35 length of claws; ovipositor 5.8 mm. long *E. apache*
Abdominal segments 2-7 usually with black hairs dorsally, venter 1-2 with fine and
3-6 with coarse erect hairs; pulvilli 26/36 length of claws; ovipositor 5.5-5.9 mm.
long *E. basingeri*
6. Scutellar hairs all or largely white; abdominal segment 1 white haired, 2-7 at most
narrowly black haired dorsally; ovipositor 5.5 mm. long *E. harveyi*
Scutellar hairs all or largely black; broad dorsum of abdominal segments 1-3 and
4-7 dorsally, black haired; ovipositor 6.1 mm. long *E. tolandi*
7. At most 8 scutellar bristles; bristles of tibiae and tarsi in part black 8
About 20 scutellar bristles; bristles of tibiae and tarsi largely white 10
8. Scutellar hairs black; ovipositor 4.0 mm. long *E. prattii?*
Scutellar hairs white or yellowish 9
9. Mystax yellowish; 8 black scutellar bristles; femora reddish at tip; ovipositor 3.6 mm.
long *E. snowi*
Mystax white; 4-6 white or black scutellar bristles; femora all black; ovipositor 3.8
mm. long *E. coulei*
10. Legs all black; ovipositor 4.5 mm. long *E. arida*
Basal half or more of the tibiae reddish; ovipositor 4.0 mm. long *E. subarida*

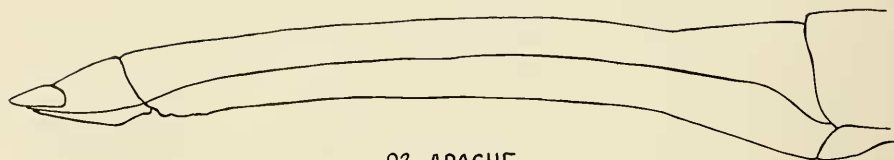
Efferia apache Wilcox, new species.

MALE. Length 19 mm. Head black, grayish white pollinose. Mystax white, hairs below black; face at antennae 37/43 width of one eye, vertex 31; hairs on frons white; 4 white bristles and a few black hairs on ocellar tubercle; occipital bristles white, hairs white with some black above; beard

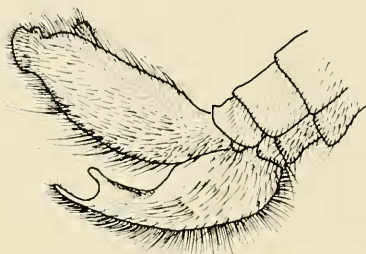
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FIGURES 77-92. *Arida* Group, lateral view of the male terminalia and ovipositor of the *Efferia* species.

77. *E. snowi* (Hine), male terminalia.
78. *E. tolandi*, new species, ovipositor.
79. *E. harveyi* (Hine), male terminalia.
80. *E. basingeri*, new species, ovipositor.
81. *E. pinali*, new species, ovipositor.
82. *E. tolandi*, new species, male terminalia.
83. *E. harveyi* (Hine), ovipositor.
84. *E. basingeri*, new species, male terminalia.
85. *E. arida* (Williston), ovipositor.
86. *E. subarida* (Bromley), male terminalia.
87. *E. coulei*, new species, male terminalia.
88. *E. subarida* (Bromley), ovipositor.
89. *E. coulei*, new species, ovipositor.
90. *E. arida* (Williston), male terminalia.
91. *E. pinali*, new species, male terminalia.
92. *E. snowi* (Hine), ovipositor.



93. APACHE



94. APACHE

FIGURES 93-94. Arida Group, lateral view of the male terminalia and ovipositor of the *Efferia* species.

93. *E. apache*, new species, ovipositor.

94. *E. apache*, new species, male terminalia.

and hairs on proboscis white; hairs on palpi mostly black. Antennae black; hairs mostly white, in part black especially on segment 1; segments measure 17-7-29-25.

Mesonotum black, yellowish gray pollinose, the central stripe and intermediate spots indistinctly brown. Hairs black, central anterior hairs subequal in length to antennae 1-2; humeri, anterior and lateral margins with white hairs. Bristles white, 2-3 presutural, 2 supraalar, 2 postalar, 4-5 posterior dorsocentral and 6-7 slender black anterior ones. Pleura yellowish gray, coxae gray pollinose; hairs and bristles white. Scutellum grayish pollinose; hairs black subequal in length to antennae 1; 9 white marginal bristles and a few longer black hairs.

Abdomen black, sides and posterior margins of 2-4 grayish pollinose, 5-7 white pollinose with some yellow basally on 5. Hairs short white, long on sides and posterior margins of 1-3, dorsum of 1-3 with some shorter black hairs. Venter grayish pollinose becoming white apically; hairs white, fine erect on 1-4, short on 5-7. Eight black with sparse white hairs. Terminalia black; hairs white, a few black basally on dorsum of surstyli; fringe brown margined with white hairs basally, about $1/2$ length of antennae 1.

Legs black, about basal half of tibiae reddish. Hairs white, a few black below on femora especially on middle and hind ones and a few above on hind metatarsi. Bristles white, very short ones below on tarsi black. Claws

black, base reddish; empodia and pulvilli light brown, pulvilli 20/35 length of claws.

Halteres light brown, base dark brown. Wings hyaline, veins brown, anterior crossvein at 35/55 length of discal cell, third vein branched opposite discal crossvein, stump vein 2/3 length of anterior crossvein.

FEMALE. Length 23 mm. Bristles on head yellowish; antennal hairs all whitish. Mesonotal bristles light brown to brownish white, 9-10 posterior and 3-4 anterior dorsocentral plus 1-2 slender black ones. Scutellar hairs mostly black, some whitish hairs laterally; 15 whitish marginal bristles. Abdomen grayish pollinose; hairs short white, longer on sides of 1-3; 1 dorsally with some short black hairs and 6 brownish white lateral bristles. Venter grayish pollinose; hairs white, fine erect on 1-5. Ovipositor black, 5.8 mm. long, at middle 1/10 as wide as long. Anterior crossvein at 36/59 length of discal cell, third vein branched slightly before discal crossvein.

HOLOTYPE. Male, Chambers, Arizona, 18 May 1965 (J. Wilcox), CAS.

ALLOTYPE. Female, same data.

PARATYPES. 3♂♂, 10♀♀, same data; 1♂, 1♀, Adamana, Arizona, 18 May 1965 (J. Wilcox). This species has the shortest pulvilli of any seen in the genus *Efferia*; measurements are made on the hind legs and both the pulvilli and claws are measured from the apex of tarsal segment 5.

Efferia arida (Williston).

Erax aridus WILLISTON, 1893, North Amer. Fauna., vol. 7, no. 2, p. 254. Type male, Death Valley Expedition, April 1891 (California), USNM.

Erax aridus, HINE, 1919, Ann. Entomol. Soc. Amer., vol. 12, p. 117. Description, no other records.

MALE. Length 22 mm. Head black, gray pollinose, gibbosity shining. Mystax white, black hairs below and on sides extending to 2/3 height of gibbosity; face 50/55 width of one eye, vertex 42. Hairs on frons mixed black and white; 4 white and 4 black bristles on ocellar tubercle; occipital bristles yellowish with some black hairs intermixed above; beard, hairs of proboscis and below on palpi white, above on palpi black. Antennae black, hairs mostly black below and mostly white above; segments measure 17-15-29-32.

Mesonotum black, gray pollinose, central stripe and intermediate area brown. Hairs black, anteriorly on humeri and laterally above wings white; hairs on central stripe as long as antennal segments 1-2. Bristles white, 3 presutural, 2 supraalar and 2 postalar. Pleura and coxae thinly grayish brown pollinose, hairs and bristles white, a few black hairs above on mesopleura. Scutellum thinly gray pollinose, hairs long black, about 18 white marginal bristles.

Abdomen black, segments 1-5 thinly brownish pollinose, apex of 5 grayish, 6-7 white pollinose. Hairs long black on 1-3, white on 4-7, sides of 1 and posterior corners of 2-3 with some white hairs and dorsum of 4-5 with short black hairs; venter long white haired, 2-3 with some black hairs. Terminalia black; hairs on surstyli white, dorsally black; hairs on lower forceps white, the ventral fringe short brown, with sparse white hairs on outer margin.

Legs black, bristles largely white, a few black ones on middle and hind femora and tibiae. Hairs largely white, some black hairs above and below on femora, short above apically on middle and hind femora. Claws black, brownish basally; pulvilli and empodia brown.

Halteres brown; stem lighter. Wings hyaline, veins brown, anterior crossvein at 48/78 length of discal cell, third vein branched slightly beyond end of discal cell, stump vein as long as anterior crossvein.

FEMALE. Length 26 mm. Hairs on frons and ocellar tubercle largely white. About 24 white marginal scutellar bristles, a few white hairs basally among the black ones. Abdomen black, sides of 1-7 and narrow posterior margins 2-6 grayish pollinose; hairs sparse white, longer on sides of 1-4, dorsum 1-7 with short black hairs. Venter grayish pollinose, sparse hairs erect white. Ovipositor black, 3.8 mm. long, narrow beyond basal 1/5, at middle 1/6 as wide as long. Anterior crossvein at 40/72 length of discal cell, third vein branched opposite discal crossvein.

Specimens are known from the following localities. *California*: Adelanto, 17 March, 7 April 1957 (C. H. Martin, J. Wilcox); Boron, 3 April 1959 (E. G. Linsley, J. W. MacSwain); Cima, 27 March 1932 (Edmand Jaeger); Inyokern, 14 March 1941 (T. H. G. Aitken); Ivanpah, 6 mi. S., 16 April 1964 (R. L. Langston); Kramer Hills, 19 April 1958, 25 April 1957 (J. Powell, G. I. Stage); Kramer Junction, 30 April 1935 (G. A. Marsh); Littlerock, 2 to 23 March 1941 (Josephine and Mary V. Lee, M. W., Jr. and M. W. Stone, Dan Toland, Itol J., Joe Jr. and J. Wilcox); Llano, 18 March 1957 (J. Wilcox); New York Mountains, Kingstone Canyon, 5400-5800', 20-22 April 1960 (J. M. and S. N. Burns); Oro Grande, 15 April 1938 (T. Aitken); Palmdale, 18 March 1957 (J. Wilcox); Providence Mountains, 16 April 1949 (D. Weber); Salt Wells, 7 mi. W., 31 March, 1 April 1959 (J. R. Powers, G. I. Stage, R. W. Thorp). *Nevada*: Clarks Station, 16 mi. E. of Reno, 9 April 1960 (P. Paige); Reno, 3 April 1959 (F. D. Parker). *Utah*: Santa Clara, 21 March 1953 (James L. Eastin).

***Efferia basingeri* Wilcox, new species.**

MALE. Length 24 mm. Head black, white pollinose, face at antennae 41/51 width of one eye, vertex 35. Hairs and bristles white; a few below in mystax, 2-3 on ocellar tubercle, 3-4 on upper occiput, and a few dorsally on palpi, black. Antennae black, hairs white, segments measure 18-8-17-32.

Mesonotum black, gray pollinose with a brown tinge. Hairs black, shorter than antennal segments 1-2 anteriorly in the central row, longer posteriorly with some white bristles; humeri, anterior and lateral margins with white hairs. Bristles white, 3 presutural, 2 supraalar, 3 postalar. Pleura and coxae grayish brown pollinose, hairs and bristles white. Scutellum grayish brown pollinose, discal hairs black, 28 white bristles, a few white hairs laterally.

Abdomen black, segments 2-5 brown subshining, sides and posterior margins gray pollinose, 6-7 white pollinose. Hairs white, a few short black hairs at middle basally on segments 1-3; venter white haired. Terminalia brown; hairs on surstyli white, a few dorsally at middle black; lower forceps white haired, ventral fringe longer basally than apically, black but almost concealed by margin of white hairs; segment 8 white pollinose and white haired.

Femora and hind tibiae and tarsi black, middle tibiae and tarsi reddish. Hairs white, a few short black on dorsum of fore and middle femora and scattered longer ones above and below on hind femora. Bristles on femora black, white on fore tibiae, mixed on middle and hind tibiae, white on tarsi. Claws black, reddish basally; empodia and pulvilli brownish.

Halteres brown, stem lighter. Wings hyaline, veins brown, anterior crossvein at 37/67 length of discal cell, third vein branched opposite end of discal cell, stump vein as long as anterior crossvein.

FEMALE. Length 25 mm. More black hairs on the palpi. Abdomen gray pollinose and short white haired, a few black hairs at middle of segment 1; ovipositor black, slender, 5.9 mm. long. Only basal half of fore tibiae reddish.

HOLOTYPE. Male, Pyramid Lake, Nevada, 4 October 1935 (A. J. Basinger), CAS.

ALLOTYPE. Female, Winnemucca Lake, Nevada, 4 October 1935 (A. J. Basinger), CAS.

PARATYPES. *Nevada*: 1 ♂, 4 ♀♀, same data as holotype, CAS, male and female on same pin, 27 September 1953 (R. M. Bohart), UCD; 2 ♂♂, 3 ♀♀, Fernley, 14 September 1956 (T. R. Haig), UCD; 12 ♂♂, 5 ♀♀, 4 mi. N., 12 September 1963 (J. Wilcox), JW; 1 ♂, 1 ♀, 22 mi. S., 12 September 1963 (J. Wilcox), JW; 4 ♂♂, 3 ♀♀, 17 mi. S. of Hawthorne, Whiskey Flat, 13 September 1963 (J. Wilcox), JW; 1 ♂, Las Vegas, 17 September 1958 (T. R. Haig), UCD; 2 ♂♂, Lovelock, 30 August 1956 (T. R. Haig), UCD; 2 ♂♂, 1 ♀, 5 mi. W. of Nixon, 9 September 1960 (A. S. Menke), UCD; 1 ♀, 17 mi. N. of Sparks, Washoe County, 2 September 1951 (E. G. Linsley) *Chrysothamnus nauseosus consimilis*, CIS; 1 ♀, Valmy, 13 September 1956 (T. R. Haig), UCD; 40 ♂♂, 11 ♀♀, 2 mi. N. of Wadsworth, 12 September 1963 (Itol J. and J. Wilcox), JW; 1 ♂, 2 ♀♀, Winnemucca, 30 August 1956, 9 September 1959 (T. R. Haig), UCD; 10 ♂♂, 12 ♀♀, 15 mi. S.W., 9

September 1959 (T. R. Haig), UCD. *California*: 1 ♂, Antelope Springs, Inyo County, 24 August 1960 (J. W. MacSwain), CIS; 2 ♂♂ on one pin, 2 ♀♀, Deep Springs, Inyo County, 10 September 1965 (J. A. Chemsak, P. D. Hurd) *Chrysothamnus*, CIS; 1 ♀, 10 mi. S. of Eagleville, Modoc County, 11 August 1959 (J. A. Chemsak), CIS.

Named in honor of A. J. Basinger, Riverside, California, who has been interested in and collected robber flies for a number of years.

***Efferia coulei* Wilcox, new species.**

MALE. Length 15 mm. Head black, grayish white pollinose, subshining on frons and gibbosity. Mystax white, lower 2/5 on the sides black; face at antennae 31/34 width of one eye, vertex 28; hairs on sides of frons largely black; 6 black bristles on ocellar tubercle; occipital bristles black, hairs white; beard, hairs on proboscis and below on palpi white, above on palpi black. Antennae black; hairs above black, mixed black and white below; segments measure 10-6-12-21.

Mesonotum black, grayish brown pollinose, central stripe and intermediate area darker at some angles. Hairs black, central hairs sparse but extending into dorsocentral rows, as long as antennal segments 1-2; a few white hairs on humeri and above wings. Bristles black, 3 presutural, 2 supraalar, 2 postalar. Pleura and coxae brownish pollinose, hairs and bristles white. Scutellum brownish pollinose, hairs black, 6 black marginal bristles.

Abdomen black, segments 1-3 and narrow base of 4, brownish pollinose, the dorsum shining black at some angles, 4-7 whitish pollinose. Hairs white, long on sides of 1-3 and parted on 4, dorsum 1-3 short black haired; venter white haired. Terminalia black; hairs on surstyli yellowish, black dorsally; lower forceps yellowish haired, ventral fringe brown, long basally becoming shorter apically, a few outer hairs yellowish. Segment 8 subshining black, yellowish haired.

Femora black, tibiae and tarsi brownish. Hairs white, above and below on femora black, those on middle and hind ones short. Bristles black; claws black, reddish basally; pulvilli and empodia light brown.

Halteres brown, stem lighter. Wings hyaline, veins brown, anterior crossvein at 24/41 length of discal cell, third vein branched opposite end of discal cell, stump vein subequal in length to anterior crossvein.

FEMALE. Length 14 mm. Two stronger black bristles and a few hairs below in mystax black. Occipital bristles white except 2 black on one side. Antennal hairs below white, mostly black above. Five of the scutellar bristles white, discal hairs short black and white. Abdomen grayish pollinose, dorsum of 1-7 and sides of 7, subshining brown; hairs short white with a few black on dorsum; ovipositor brown, 3.6 mm. long. Hairs on legs white

except a few short ones above on middle and hind femora. Third vein branched slightly beyond end of discal cell.

HOLOTYPE. Male, Moses Coule, Washington, 5 May 1935 (Itol J. Wilcox), CAS.

ALLOTYPE. Female, same data, 7 May 1933.

PARATYPES. 24♂♂, 17♀♀, same data, 4, 5 May 1935, 6, 7 May 1933 (Itol J. and J. Wilcox), JW; 1♂, 3♀♀, Ellensburg, Washington, 11 June 1933 (C. W. Getzendaner), JW.

***Efferia cuervana* (Hardy).**

Erax cuervanus HARDY, 1943, Jour. Kansas Entomol. Soc., vol. 16, p. 27, fig. male genitalia.

Type male, Cuervo, New Mexico, June 23, 1940 (E. E. Kenaga), female, and male and female paratypes, same data (R. H. Beamer, D. E. Hardy, L. C. Kuitert), UK.

This species has not been seen by me. Its small size, length 10-12 mm., yellowish red legs except extreme apices of femora and apical subsegments of tarsi, blackened, readily separates it from the other species. The hypopygium is reddish with yellow hairs, black on dorsum; in dorsal view it is broad apically and narrow at base, similar to *E. prattii* (Hine).

***Efferia harveyi* (Hine).**

Erax harveyi HINE, 1919, Ann. Entomol. Soc. Amer., vol. 12, p. 115. Types male and female, Vernon, British Columbia, August 11 and 15, 1904 (Captain R. Valentine Harvey), OSU.

The late S. W. Bromley compared specimens for me with the Hine types in 1935.

Specimens are known from the following localities. *California*: Gazelle, Siskiyou County, 22 September 1951 (Jack Hall, E. I. Schlinger). *Oregon*: Hermiston, 18 September 1917 (M. M. Reeher). *Washington*: Buena, 23 August 1936 (Wm. W. Baker); Kennewick, 8 September 1932 (J. Wilcox); 6 mi. W. of Cowiche, 10 August 1941 (Reeves and Brookman); Kiona, 10 August 1934 (J. Wilcox); Mabton, 23 August 1936 (Wm. W. Baker); Prosser, 1 October 1931 (M. C. Lane); Republic, 6 August 1935 (L. D. Anderson, J. Nottingham, H. T. Peters); Soap Lake, 9 September 1931 (A. E. Bonn); Selah, Yakima County, 6 mi. N.E., 9 August 1941 (B. Brookman); White Swan, Yakima County, 24 August 1941 (B. Brookman); Yakima, 12 August, 7 September 1932 (A. R. Rolfs), 28 August 1932 (Wm. W. Baker).

***Efferia pinali* Wilcox, new species.**

Erax subaridus BROMLEY, 1941, Bull. Brooklyn Entomol. Soc., vol. 35, p. 14, in part.

MALE. Length 23 mm. Head black, white pollinose, gibbosity and frons subshining; face at antennae 46/50 width of one eye, vertex 35. Mystax white, hairs below and on sides extending 5/6 distance to antennae black;

hairs on sides of frons mixed black and white; 6 black bristles on ocellar tubercle and some long black hairs; occipital bristles white but some hairs on upper occiput black; beard, hairs on proboscis and below on palpi white, palpi mostly black haired. Antennae black; hairs black and white, segments measure 20-8-20-34.

Mesonotum black, grayish brown pollinose, central stripe and intermediate area black at some angles. Hairs black, on central stripe as long as antennal segments 1-2; a few white hairs above wings. Bristles, 3 yellowish presutural, 1 supraalar and 2 postalar black. Pleura and coxae brownish pollinose, hairs and bristles white, above on mesopleura black. Scutellum brownish pollinose, hairs black and nearly as long on disc as posteriorly, 17 slender black marginal bristles.

Abdomen black, segments 1-5 brownish pollinose but appearing black, sides and posterior margins 2-5 and 6-7 wholly, gray pollinose. Hairs dorsally black becoming shorter apically, on the sides white; 6-7 mostly fine recumbent white haired; venter white haired, some black on 2-3 and apex of 7. Terminalia black; surstyli white haired, dorsally black haired and with 4-5 long black hairs on lower margin apically; lower forceps white haired, ventral fringe short sparse brown with marginal white hairs.

Legs black, basal 4/5 of fore and middle and basal 1/2 of hind tibiae reddish. Hairs white, some long black hairs below on femora and some short black above on middle femora. Bristles of femora and tibiae black, of tarsi white. Claws black, base reddish; empodia and pulvilli brownish.

Halteres brown. Wings hyaline, yellowish along the veins especially apically, veins brown, anterior crossvein at 45/73 length of discal cell, third vein branched opposite end of discal cell, stump vein subequal to length of anterior crossvein.

FEMALE. Length 27 mm. Abdomen grayish pollinose, the dorsum brown subshining black; hairs short white, black dorsally; venter white haired; ovipositor black, 6.4 mm. long. Bristles of femora in part yellowish and anteriorly on fore tibiae white.

HOLOTYPE. Male, base of Pinal Mountains, Arizona, March (D. K. Duncan), CAS.

ALLOTYPE. Female, Globe, Arizona, March (D. K. Duncan). -

PARATYPES. 12♂♂, 9♀♀, same data as holotype, JW; 2♂♂, 1♀, same data as allotype, JW; 2♂♂, 5♀♀, Roosevelt Lake, Arizona, April (D. K. Duncan), JW; 2♀♀, Sierra Ancha Mountains, Arizona, March (D. K. Duncan), JW.

Bromley (1941) says, "The series of paratypes from the base of the Pinal Mountains, Arizona, collected by Mr. Duncan, are larger (21-25 mm.) and blacker with even more black bristles on the legs."

The holotype locality is given by Mr. Duncan as 15 mi. SE. of Globe, Mescal Mountains, 4,000-5,000 feet, March 7, 1934. The Pinal Mountains are south of Globe and according to the maps available are circled on the south and south west by the Mescal Mountains. The Roosevelt Lake locality is given as, on summit between Globe and Roosevelt Lake, N.E. tip of Superstition Mountains, elevation about 4,000 feet, March 11, 1934.

Efferia prattii (Hine).

Erax prattii HINE, 1919, Ann. Entomol. Soc. Amer., vol. 12, p. 117, fig. male genitalia dorsal view. Type male, Laredo, Texas, November 25, 1905 (F. C. Pratt), OSU.

Bromley (1934) reports from Bexar County, Texas, May 28, 1929 (H. B. P.). This specimen, a female, was collected March 28, 1929 (H. B. Parks) and is very similar to other specimens collected in the same locality by Mr. Parks in April and May and determined as belonging to *E. snowi* (Hine).

Hine's figure of the male genitalia, dorsal view, shows it to be twice as broad apically as at the base, femora black and length 16 mm.

Efferia snowi (Hine).

Erax snowi HINE, 1919, Ann. Entomol. Soc. Amer., vol. 12, p. 116. Types male and female, Clark County, Kansas, 1,962 feet, May (F. H. Snow), OSU. More than 50 other specimens from Kansas, Colorado, New Mexico, and Texas.

Bromley (1934) reports from the following localities in *Texas*: Bexar, Frio, Jim Hogg, Mills, and Travis counties. February 18-June.

James (1941) reports from *Colorado*: Francis; Arboles; Horsetooth Gulch, Larimer County; College Pasture and Spring Canyon, near Ft. Collins; Chimney Rock; Late May to August and says, "This is our earliest *Erax* in chaparral near Ft. Collins."

Specimens are known from the following localities. *New Mexico*: 7.5 mi. W. of Moriarity, 17 May 1965 (J. Wilcox); 5 mi. W. of Santa Rosa, 17 May 1965 (J. Wilcox); 5 mi. N. of Vaughn, 16 May 1965 (J. Wilcox). *Texas*: Bexar County, 5, 9, 27 April, 1 May 1929 (H. B. Parks); Dimmit, 18 March 1933; Goldthwaite, 21 April 1922; Pearsall, 18 April 1933 (B. E. Jones); Taylor, 9 May 1928.

Hine's types were 22 mm. long. Most of the above specimens are smaller but range from 14 to 24 mm. in length.

Efferia subarida (Bromley).

Erax subaridus BROMLEY, 1941, Bull. Brooklyn Entomol. Soc., vol. 35, p. 14 (in part). Types male and female, Tucson, Arizona, March 8, 1937 (W. Benedict), UK. Paratypes, same data and Baboquivari Mountains, Arizona, March 31, 1937 (W. Benedict), and base of Pinal Mountains, March (D. K. Duncan).

Material is known from the following localities. *Arizona*: Ciengo Creek, near Pantano, 3,000 feet, 14 March 1932 (D. K. Duncan); 2 mi. N.E. of Portal, 11, 16 February 1962 (M. A. Cazier); Santa Catalina Mountains, 17 March 1937 (Owen Bryant) Lot 19, March (D. K. Duncan); Tucson, 15 March 1937 (Owen Bryant) Lot 18, 8 mi. N., 22, 23 February, 15, 16 March 1963 (Earl G. Davis). *New Mexico*: Albuquerque, 1 May 1937 (G. P. Engelhardt); Grant County, 11 March 1934 (R. T. Kellogg).

***Efferia subpilosa* (Schaeffer).**

Erax subpilosus SCHAEFFER, 1916, Jour. New York Entomol. Soc., vol. 24, p. 67. Type male, Beaver Creek Hills, Beaver County, Utah (Doll and Engelhardt), USNM.

Erax subpilosus, HINE, 1919, Ann. Entomol. Soc. Amer., vol. 12, p. 118.

Male description except for the last line is the Schaeffer description. The female description could fit *E. basingeri* as he reports specimens from Reno, Nevada, New Mexico, and California. It is possible that *E. basingeri* will be a synonym of *E. subpilosa* but it is not certain that *E. subpilosa* belongs in the Arida Group, Hine mentioned the white leg bristles but they are not in the Schaeffer description. The only material available from southwestern Utah belongs in the Pogonias Group.

***Efferia tolandi* Wilcox, new species.**

MALE. Length 28 mm. Head black, gray pollinose; face at antennae 50/60 width of one eye, vertex 45. Hairs and bristles white except a few below in mystax and dorsally on palpi black. Antennae black, hairs white, segments measure 20-8-18-43.

Mesonotum black, gray pollinose with slight brownish tinge. Hairs black, anterior crest shorter than antennal segments 1-2 with longer black hairs and white bristles posteriorly; hairs on anterior and lateral margins and mostly on humeri, white. Bristles white, 3-4 presutural, 3 supraalar, 4-5 postalar. Pleura and coxae black, grayish pollinose, hairs and bristles white. Scutellum black, grayish pollinose, discal hairs black, about 20 white marginal bristles.

Abdominal segments 2-5 black, thinly brown pollinose, margins of 5 and 6-8 white pollinose. Hairs white, dorsum of 1-3 with black hairs basally. Venter 1-5 brownish, 6-7 white, 8 black; hairs erect white on 1-5, a few black on 2-3. Terminalia black; surstyli with white hairs, dorsum black haired; lower forceps white haired, ventral fringe black with numerous marginal white hairs, fringe dense and about as long as antennal segment 1.

Legs black, tibiae slightly brownish basally. Hairs white, some black above and below on femora and above on hind tibiae. Bristles largely white, some on femora black and below on tarsi. Claws black, reddish basally; empodia and pulvilli brownish.

Halteres brown. Wings hyaline, veins brown, anterior crossvein at 46/81 length of discal cell, third vein branched opposite the end of the discal cell, stump vein a little shorter than the anterior crossvein.

FEMALE. Length 31 mm. Two bristles and a few hairs on each side of upper occiput, black. Sides and posterior margins of abdominal segments grayish pollinose, dorsum black with short black hairs, hairs on sides white, longer on 1-3; venter grayish pollinose, hairs erect white on 1-6, shorter on 7; ovipositor black, 6.1 mm. long, at middle 1/10 as wide as long.

HOLOTYPE. Male, Independence, California (Grays Meadow), 9 October 1964 (J. Wilcox), CAS.

ALLOTYPE. Female, same data.

PARATYPES. 2♂♂, 12♀♀, same data (Itol J. and J. Wilcox), JW; 1♂, 3♀♀, 5 mi. N. of Big Pine, California, 6 September 1958 (A. D. Telford), UCD; 1♂, Cushenbury Springs, San Bernardino County, California, 18 September 1948 (Guy F. Toland), 1♀, same general locality, 6.7 mi. S.E. of Lucerne Valley, California, 4 October 1963 (J. Wilcox), JW; 1♂, 3 mi. N.E. of Mojave, Kern County, California, 6 October 1957 (J. W. MacSwain), CIS; 4♂♂, 1♀, Mono Lake, California, 13 September 1963 (J. Wilcox), JW; 1♂, Sherwin Summit, Mono County, California, 10 September 1956 (E. G. Linsley), CIS; 1♂, Walker Pass, Kern County, California, 8 October 1957 (J. C. Hall), UCD.

CARINATA GROUP

Hine (1919) defines this group as follows: "In Western United States and extending into Mexico and Central America there are several species of the genus *Erax* that are distinct from the others on account of the following characters: "

"The dorsum of the mesothorax is more convex than usual, with a distinct crest of erect hairs on the middle of the dorsum, beginning just behind the head and extending back to beyond half the distance to the scutellum. Branching of the third vein beyond the base of the second posterior cell; stump rudimentary or altogether absent in the male, present and somewhat variable in length in the female; costa in the male always thickened and expanded but much more evident in some species than in others."

The crest on the mesonotum arises from the central stripe and in most species is formed of dense hairs but in *E. cressoni*, *E. latruncula*, and *E. ordwayae* it is composed mainly of bristles or bristlelike hairs. The ground color of the body is metallic black with greenish or purplish reflections. The mesonotum appears to be more highly arched and compressed laterally than in the other groups, its height at the suture is about three-fourths its width in dorsal view.

Efferia willistoni has been transferred to this group from the Albibarbis Group where it was placed by Hine. It shows most of the above characters plus the rudimentary stump vein and dilated costa in the males, but the mesonotal crest is not as definite as in the other species. The anterior mesonotal hairs are subequal in length to antennal segment 1 and nearly twice as long at the suture. With this transfer all the Nearctic species in the Albibarbis Group have quite short hair anteriorly on the mesonotum.

KEY TO THE SPECIES OF THE CARINATA GROUP—MALES

1. Abdomen without long white parted hair 2
 Abdomen with long white parted hair on several segments 6
2. Abdomen wholly grayish pollinose and white haired; scutellar bristles white; femora black, tibiae and tarsi reddish; hairs and bristles of head all white, of mesonotum white except crest formed of a few black bristles and sparse black hairs; costa not dilated; length 16 mm. (Arizona, New Mexico) *E. ordwayae*, new species
 Basal part of abdominal segments 2-4 or 2-5 black, at least some black hairs on 4-5; scutellar bristles black 3
3. Scutellum with 10 marginal bristles or less, usually black, discal hairs white; wings hyaline or nearly so 4
 Scutellum with about 20 black bristles, discal hairs black and white, sparse; wings brownish or tinged with brown 5
4. Mesonotal crest formed mainly of bristles as long as antennal segments 1-2; abdominal segments 5-7 white pollinose, 5 with a dorsal brown spot, venter with short hairs on segments 4-6; length 15-18 mm. (Arizona, Montana, New Mexico)
 *E. latruncula* (Williston)
 Mesonotal crest formed of hairs, anteriorly as long as antennal segment 1; abdominal segments 5-7 or 6-7 white pollinose, venter of 1-7 with long erect white hairs; length 13-23 mm. (Arizona, Colorado, Mexico, New Mexico) *E. willistoni* (Hine)
5. Abdominal segments 1-5 largely black, 6-7 silvery pollinose, 5 with short black hairs; lower forceps with lower apex acute, sternite 9 visible as 2 shining lobes; length 18-23 mm. (Arizona, Colorado, New Mexico) *E. jubata* (Williston)
 Abdominal segments 1-4 largely black, 5-7 silvery pollinose, 5 with long white hairs apically; lower forceps with lower angle obtuse, sternite 9 not visible; length 15-19 mm. (Arizona, Mexico, New Mexico) *E. prolifica* (Osten Sacken)
6. Mystax largely white; wings hyaline 7
 Mystax largely black; wings light brownish 8
7. Mesonotal crest dense, narrow, formed mainly of hairs; abdominal segments 2-6 with long white parted hair; length 12-17 mm. (Arizona, California, Mexico, Nevada)
 *E. caliente*, new species
 Mesonotal crest sparse, formed mainly of bristles; abdominal segments 2-5 with long white parted hair; length 12-15 mm. (Arizona, New Mexico, Texas)
 *E. cressoni* (Hine)
8. Mesonotal crest of hairs anteriorly subequal in length to antennal segment 1; discal hairs of scutellum sparse white and shorter than marginal bristles; abdominal segments 2-7, 3-7 or 4-7 white pollinose with sparse white parted hairs; length 13-23 mm. (Arizona, Colorado, Mexico, New Mexico) *E. willistoni* (Hine)
 Mesonotal crest of hairs subequal in length to antennal segments 1-3; discal hairs of scutellum dense white and nearly as long as the marginal bristles 9

9. Abdominal segments 2-5 with white parted hair, 2-4 and 7 largely black, 7 with black hairs apically; length 15-20 mm. (Arizona, Colorado, Montana, Nevada, New Mexico) *E. subcuprea* (Schaeffer)
- Abdominal segments 2-6 with white parted hair, 2-3 black basally, 7 white pollinose with short white hair; length 14-16 mm. (Arizona, Colorado, Montana, Utah, Wyoming) *E. costalis* (Williston)

KEY TO THE SPECIES OF THE CARINATA GROUP—FEMALES

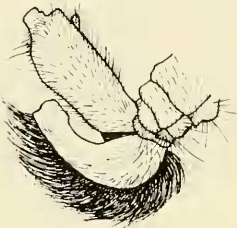
1. Ovipositor short and broad, at the middle 4-5 times as long as broad, length 3.0 to 3.5 mm. 2
- Ovipositor slender, at the middle at least 6 times as long as broad, length 4.0 mm. or more 4
2. Mesonotal crest narrow, dense, formed mainly of black hairs; legs black, at most tibiae reddish basally; ovipositor 3.4 mm. long *E. caliente*
- Mesonotal crest sparse, formed mainly of black bristles; tibiae and tarsi largely reddish 3
3. Leg bristles largely white, tibiae and tarsi reddish; abdomen largely grayish pollinose; ovipositor 3.0 mm. long *E. cressoni*
- Leg bristles largely black, tips of tibiae brown; central basal portion of abdominal segments dull black; ovipositor 3.0 mm. long *E. latruncula*
4. Ovipositor 5.6 to 6.5 mm. long 5
- Ovipositor 4-5 mm. long 6
5. Mesonotal crest of hairs subequal in length to antennal segments 1-3; discal hairs of scutellum dense and nearly as long as the marginal bristles; ovipositor 5.6 to 6.5 mm. long *E. subcuprea*
- Mesonotal hairs anteriorly subequal in length to antennal segment 1; discal hairs of scutellum sparse, about half the length of marginal bristles; ovipositor 5.6 mm. long *E. willistoni*
6. Scutellum with about 20 bristles, hairs black and white 7
- Scutellum at most with 6 marginal bristles, hairs white 8
7. Ovipositor constricted between segments 8 and 9, tergite 9 rugose on upper half; ovipositor 4.5 mm. long *E. jubata*
- Ovipositor not constricted, tergite 9 largely polished with a small roughened area dorsally; ovipositor 4.6 mm. long *E. prolifica*
8. Mystax white; scutellar bristles white; mesonotal crest formed of sparse bristles; abdomen gray pollinose; ovipositor 4.9 mm. long *E. ordwayae*
- Mystax about half black and white; 2-4 black scutellar bristles; mesonotal crest formed of moderately dense hairs; abdominal segments 2-7 black, sides and posterior margins gray pollinose; ovipositor 3.5 mm. long (see text) *E. costalis*

Efferia caliente Wilcox, new species.

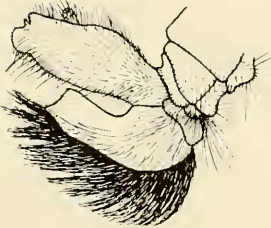
MALE. Length 15 mm. Head black, white pollinose, gibbosity and frons subshining black. Oral hairs of mystax black, white above with about 24 longer black bristlelike hairs on the sides and mixed in above; face at antennae 34/40 width of one eye, vertex 28. Frons with fine erect white hairs, 2 black on one side; ocellar tubercle with 2 long slender black bristles; 3-4 yellowish occipital bristles, 2 black on one side, numerous fine white hairs; beard, hairs on proboscis and basally on palpi white, palpi apically with long



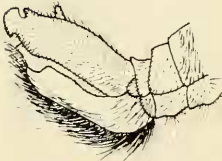
95. CRESSONI



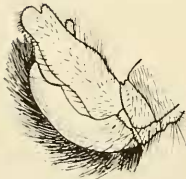
98. PROLIFICA



101. JUBATA



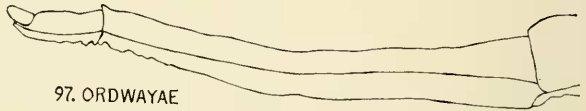
104. SUBCUPREA



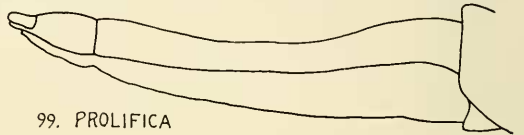
108. COSTALIS



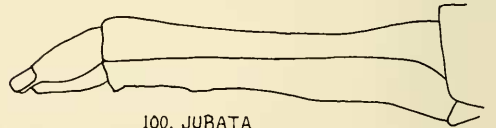
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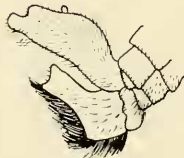
97. ORDWAYAE



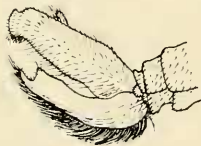
99. PROLIFICA



100. JUBATA



102. LATRUNCULA



105. ORDWAYAE



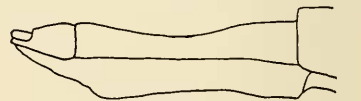
109. CALIENTE



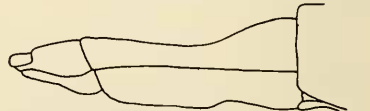
103. COSTALIS



106. LATRUNCULA



107. CRESSONI



110. CALIENTE

dense black hairs. Antennae black, hairs white, 2-3 black hairs below on segment 1; segments measure 12-6-12-24.

Mesonotum black, grayish white pollinose, intermediate spots thinly brown pollinose but appearing black at most angles. Central crest formed of dense black hairs as long as antennal segments 1-2 extending to scutellum, sparse shorter white hairs on sides and longer black bristlelike hairs mixed in crest; sparse erect hairs on intermediate area black, humeri and margins with erect white hairs. Bristles black, 2-3 presutural, 1-2 supraalar, 1-2 postalar, 1 black posterior dorsocentral on one side, 3-4 others white hair-like. Pleura and coxae thinly gray pollinose, hairs white, a few black hairs on sterno- and mesopleura. Scutellum thinly gray pollinose, subshining black, about 24 long white bristlelike hairs on posterior margins, discal hairs dense erect white and as long as antennal segments 1-2.

Abdomen subshining metallic black, narrow sides and posterior margins of segments 2-4 grayish pollinose, 5-7 densely grayish white; long white parted hair on 1-6, short on 7. Venter grayish pollinose, subshining black; hairs long dense erect white; 6-7 bulging; 8 narrow with short coarse white hairs. Terminalia shining black; surstyli with short white hairs, dorsum narrowly with short black hairs, ventral margin with longer white hairs; lower forceps with sparse white hairs, ventral fringe dense brown margined with sparse white hairs, fringe as long as antennal segments 1-2.

Legs black; bristles black; hairs white, on dorsum of fore femora long fine erect black and a few black hairs among the white below on the fore femora

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FIGURES 95-110. Carinata Group, lateral view of the male terminalia and ovipositor of the *Efferia* species.

95. *E. cressoni* (Hine), male terminalia.
96. *E. subcuprea* (Schaeffer), ovipositor.
97. *E. ordwayae*, new species, ovipositor.
98. *E. prolifica* (Osten Sacken), male terminalia.
99. *E. prolifica* (Osten Sacken), ovipositor.
100. *E. jubata* (Williston), ovipositor.
101. *E. jubata* (Williston), male terminalia.
102. *E. latruncula* (Williston), male terminalia.
103. *E. costalis* (Williston), ovipositor.
104. *E. subcuprea* (Schaeffer), male terminalia.
105. *E. ordwayae*, new species, male terminalia.
106. *E. latruncula* (Williston), ovipositor.
107. *E. cressoni* (Hine), ovipositor.
108. *E. costalis* (Williston), male terminalia.
109. *E. caliente*, new species, male terminalia.
110. *E. caliente*, new species, ovipositor.

and tibiae, short black hairs above on middle and hind femora and on outer tarsal segments. Claws black, base reddish; empodia and pulvilli brown.

Upper half of knob of halteres reddish, lower half and base brown, stem pale brown. Wings hyaline, veins brown, anterior crossvein at $42/57$ length of discal cell, third vein branched beyond discal crossvein and with very short stump vein, costa dilated at $2/3$ length of wing and subcostal cell brown opposite the apical $2/3$ of the discal cell.

FEMALE. Length 18 mm. About 16 black bristlelike hairs in the mystax; hairs on frons white; occipital bristles yellowish. Mesonotal hairs white other than crest; bristles brown (1 postalar black); 4-5 posterior dorsocentral (1 black on each side). Sides and posterior margins of abdominal segments 2-7 grayish pollinose, dorsum subshining black; hairs long white, almost parted on 1-5, shorter on 6-7 and dorsum with short black hairs; ovipositor black, 3.4 mm. long, at the middle, $1/4$ as broad as long. Anterior crossvein at $38/56$ length of discal cell, costa not dilated or brown on margin.

HOLOTYPE. Male, Agua Caliente Springs, San Diego County, California, 2 April 1942 (J. Wilcox), CAS.

ALLOTYPE. Female, same data, 31 March 1942.

PARATYPES. *California*: 22 ♂♂, 13 ♀♀, same data, 31 March to 3 April 1942 (Don Meadows, W. Schweikhard, J. Wilcox), JW; 10 ♂♂, 25 ♀♀, 4 mi. S.E. of Dry Lake (Ocotillo Wells), San Diego County, 3, 4 April 1942 (W. Schweikhard, Joe Jr. and J. Wilcox), JW; 1 ♂, 10 mi. E. of Desert Center, 13 April 1941 (J. Wilcox), JW; 1 ♀, 5 mi. S. of Fish Springs, Imperial County, 25 March 1930 (P. H. Timberlake), UCR; 1 ♀, Lone Palm Canyon, 31 March 1960 (P. H. Timberlake), UCR; 2 ♂♂, 3 ♀♀, 22 mi. N. of Manix, San Bernardino County, 26 April 1953 (P. D. Hurd, R. O. Schuster) *Larrea*, CIS; 1 ♂, Morongo Valley, San Bernardino County, 25 April 1957 (R. R. Snelling, M. D. Stage), CIS; 2 ♂♂, 2 ♀♀, Palm Desert, 11, 13 April 1950 (P. D. Hurd), CIS, 1 ♀, 24 April 1950 (C. D. MacNeill), CIS; 1 ♂, Salton Sea, Riverside County, 24 March 1949 (R. A. Flock), UCR; 1 ♂, 4.5 mi. E. of Thousand Palms, 3 April 1946 (P. H. Timberlake), UCR. *Arizona*: 6 ♀♀, Aztec, 14 April 1964, 16 April 1941, 20 May 1965 (J. Wilcox), JW; 1 ♂, Baboquivari Mountains, April (D. K. Duncan), JW; 1 ♀, 10 mi. W. of Bylas, 29 April 1962 (J. Wilcox), JW; 1 ♀, 20 mi. S. of Gila Bend, 18 April 1965 (M. A. Cazier), ASU; 8 ♂♂, 5 ♀♀, 9.5 and 12 mi. N. of Quartzite, 16 April 1965 (M. A. Cazier), ASU; 2 ♂♂, 2 ♀♀, 15 mi. S. of Parker, 16 April 1965 (M. A. Cazier), ASU; 2 ♀♀, 8 mi. S.E. of Parker, 15 April 1965 (M. A. Cazier), ASU; 1 ♂, 1 ♀, Portal, 6 June 1964 (J. M. Davidson), ASU, 1 ♀, 1 mi. W., 16 June 1957 (M. Statham), AMNH; 1 ♂, 1 ♀, Sabino Canyon, Santa Catalina Mountains, 20 April 1962 (Earl G. Davis, J. Wilcox), JW; 1 ♀, 26 May 1962 (F. D. Parker, L. A. Stange), UCD; 1 ♀, Sacaton, 25 March 1956 (A. F. Howland), JW; 1 ♂, Sentinel, 25 March 1960 (Gertsch

and Schrammel), AMNH, 2 ♀♀, 18 April 1962 (J. Wilcox), JW; 28 ♂♂, 54 ♀♀, 8 mi. N. of Tucson, 18 April to 11 May 1962, 1964 (Earl G. Davis, J. Wilcox), JW; 1 ♂, 1 ♀, 4 mi. S. of Tumacacori, 21 April 1962 (J. Wilcox), JW; 1 ♂, 3 ♀♀, Yarnell, 27 May 1963 (M. W. Stone, J. Wilcox), JW. *Mexico*: 1 ♀, Las Animas Bay, Gulf of California, 8 May 1921 (E. P. Van Duzee), CIS; 1 ♂, 3 mi. N. of San Felipe, Baja California, 25 March 1964, elevation 10 meters (J. C. Hall), UCR. *Nevada*: 1 ♀, 10 mi. N.W. of Las Vegas, 3 June 1941 (P. H. Timberlake), UCR.

Efferia costalis (Williston).

Erax costalis WILLISTON, 1885, Trans. Amer. Entomol. Soc., vol. 12, p. 64. No type or locality, name used in key to males as follows: "Costa distinctly thickened and dilated beyond the tip of the auxiliary vein.—Hind tibiae simple; dorsum of thorax more or less mane-like.—Hypopygium of moderate size; scutellum with macrochaetae.—Third, fourth and fifth abdominal segments with long silvery-white pile *Costalis*."

Erax costalis, HINE, 1919, Ann. Entomol. Soc. Amer., vol. 12, p. 154. Description of male and female, figure of male genitalia; records from Montana, Wyoming, and Colorado.

Specimens from the following localities: *Wyoming*: Jenny Lake, Teton National Park, 20 to 30 June 1941 (G. E. Bohart); Lyman, 25 June 1935 (R. H. Beamer, Jean Russell); Yellowstone National Park, 5 July 1952 (JSF).

MALE. Length 14 mm. Face 31/43 width of one eye, vertex 23, antennae measures 10-6-11-29. Mesonotal crest rather dense hairs curved backward and as long as antennal segments 1-3. Abdominal segments 2-7 white pollinose, anterior dorsum and sides of 2 and anterior sides of 3 subshining black, parted hairs on 2-6. Tibiae and tarsi reddish. Wings hyaline, veins brown, anterior crossvein at 35/48 length of discal cell, costa dilated brown, no stump vein.

FEMALE. Length 14 mm. Broad sides and narrow posterior margins of abdominal segments 2-7, gray pollinose, hairs white, a few on 7 black, venter gray pollinose and white haired; ovipositor black, slender, 3.5 mm. long.

The ovipositor on the only specimen available from Wyoming seemed distorted. The males of the following specimens fit the key characters but the females have a long slender ovipositor similar to that found in *E. subscuprea*.

Arizona: Flagstaff, 18 June 1949 (Guy F. Toland, J. Wilcox); Williams, 14 June 1949 (Guy F. Toland, J. Wilcox); *Utah*: New Harmony, 1 June 1963 (J. Wilcox).

Efferia cressoni (Hine).

Erax cressoni HINE, 1919, Ann. Entomol. Soc. Amer., vol. 12, p. 134. Types male and female, Alamogordo, New Mexico, ANSP. Other specimens from El Paso, Texas.

Specimens are known from the following localities: *Arizona*: 8 mi. N.E. of Douglas, 23 April 1962 (J. Wilcox); 5 mi. S. of San Simon, 28 May 1962

(J. Wilcox); St. David, 23 April 1962 (J. Wilcox). *Colorado*: Ft. Collins, 23 June 1935 (R. H. Beamer). *New Mexico*: Cuervo, 17 May 1965 (J. Wilcox), Deming, Luna County, 30 May 1952 (M. Cazier, W. Gertsch, R. Schrammel); Grant County, 14 April 1933, 23, 27 May 1936 (R. T. Kellogg); Silver City, 5 May, 6 June 1933 (R. T. Kellogg); 3 mi. N. of Three Rivers, 16 May 1965 (Itol J. and J. Wilcox).

MALE. Length 13 mm. Face 26/39 width of one eye, vertex 18, antennae measure 12-5-11-24. Mesonotal crest formed of long sparse black bristles curved backward and sparse erect hairs subequal in length to antennal segments 1-2, posterior to suture sparse erect white hairs, 7 dorsocentral bristles, 2 anterior. Abdominal segments 1-7 densely grayish white pollinose, 2-5 with white parted hairs; venter 1-3 with erect white hairs, 4-7 recumbent white. Tibiae and tarsi reddish brown, hairs and bristles white, bristles on tarsi largely black. Wings hyaline, veins brown, anterior crossvein at 40/55 length of discal cell, no stump vein, costa slightly dilated and brown in subcostal cell.

FEMALE. Length 16 mm. Mystax and mesonotal bristles except crest, may be all white; 4 strong scutellar bristles all white or part black. Abdomen grayish pollinose, hairs short white, a few short black on dorsum 6-7; venter erect white on 1-2, short white 3-7; ovipositor black, 3.0 mm. long, at middle 1/5 as wide as long. Wings with short stump vein, costa not dilated.

Efferia jubata (Williston).

Erax jubatus WILLISTON, 1885, Trans. Amer. Entomol. Soc., vol. 12, p. 66. Types male and female, New Mexico (G. F. Gaumer), UK.

Erax jubatus, HINE, 1919, Ann. Entomol. Soc. Amer., vol. 12, p. 133. Description and figures of wing and male genitalia; records from northern Mexico, Arizona, New Mexico, and Colorado.

Specimens are recorded from the following localities. *Arizona*: Chiricahua Mountains, Onion Saddle, 17 September, 22 October 1962 (J. Wilcox), Pinery Canyon, 17 September, 22 October 1962 (J. Wilcox), Rustlers Park, 17 September 1962 (J. Wilcox); Chiricahua National Monument, 22 October 1962 (J. Wilcox); Santa Rita Mountains, 2 November 1935 (Owen Bryant) Lot 42, 16 November 1924 (A. A. Nichol). *Colorado*: A.S.U.C. Lodge, 13 September 1932 (M. T. James); Walden, 20 August 1931 (H. T. Peters). *New Mexico*: Silver City, 11 November 1932 (R. T. Kellogg). *Wyoming*: Grand Teton National Park, 18 August 1931 (L. D. Anderson, J. O. Nottingham).

MALE. Length 19 mm. Face 39/55 width of one eye, vertex 28, antennae measure 18-6-14-38. Mesonotal crest formed of dense black hairs as long as antennal segments 1-2 with slightly longer sparse black bristles. Abdominal segments 2-5 mostly black with short black hairs, 6-7 white with short white

hairs, venter similar in color to dorsum with erect white hairs, segments 5-7 bulging. Wings light brown, veins black, anterior crossvein at 47/67 length of discal cell, costa dilated, subcosta black, minute stump vein.

FEMALE. Length 21 mm. Dorsum of abdominal segments 2-7 with short black hairs, venter 1-7 with erect white hairs; ovipositor 4.4 mm. long at middle 1/7 as wide as long.

***Efferia latruncula* (Williston).**

Erax latrunculus WILLISTON, 1885, Trans. Amer. Entomol. Soc., vol. 12, p. 67. Types male and female, Arizona, Montana, 12 specimens (Prof. Comstock), UK.

Erax latrunculus, HINE, 1919, Ann. Entomol. Soc. Amer., vol. 12, p. 132. Description, figure of male genitalia, records from Arizona.

Specimens from following localities: *Arizona*: Atascosa Mountain, 29 April 1962 (J. Wilcox); Baboquivari Mountains, April (D. K. Duncan); Chiricahua Mountains, Southwestern Research Station, Cochise County, 21 to 27 April 1962 (Carl W. Kirkwood), Pinery Canyon, 5,000 feet, 15 June 1932 (D. K. Duncan); Flagstaff, 15 June 1948, 18 June 1949 (Guy F. Toland; and Joe Jr. and J. Wilcox); Hualapai Mountains, 6,000 feet, 23 May 1962 (J. Wilcox); Kits Peak, 26 May 1962 (J. Wilcox); Pena Blanca, 29 April 1962 (J. Wilcox); 3 mi. W. of Portal, 25 April 1962 (Itol J. and J. Wilcox); Roosevelt, 10 May 1932 (D. K. Duncan); Ruby, 29 April 1962 (Itol J. and J. Wilcox); Santa Catalina Mountains, April (D. K. Duncan), Molino F. C., 19 April 1962 (Earl G. Davis, J. Wilcox); Santa Rita Mountains, Madera Canyon, 29 April 1962 (Carl W. Kirkwood); Sierritas Mountains, 12 April 1964 (Earl G. Davis). *New Mexico*: Grant County, 7, 14 April 1933 (R. T. Kellogg); Silver City, 13 May 1934 (R. T. Kellogg).

MALE. Length 17 mm. Face 34/45 width of one eye, vertex 27, antennae measure 15-6-15-25. Mesonotal crest formed of black hairs subequal in length to antennal segment 1 with sparse longer black bristles. Dorsum of abdominal segments 2-5 black with short black hairs, 6-7 white with short white hairs; venter 1-3 with erect white hairs, short white on 4-7. Wings hyaline, anterior crossvein at 40/56 length of discal cell, no stump vein, costa dilated.

FEMALE. Length 20 mm. Abdominal segments 2-7 black with short black hairs, venter 1-2 or 1-3 with erect white hairs, remainder short white; ovipositor 3.0 mm. long, at middle 1/5 as wide as long. Wings not dilated, short stump vein.

***Efferia ordwayae* Wilcox, new species.**

MALE. Length 16 mm. Head black, white pollinose, hairs and bristles white; face 31/40 width of one eye, vertex 24. Antennae black, hairs white, segments measure 15-6-16-21.

Mesonotum black; yellowish gray pollinose; narrow central stripe and intermediate area appearing brown; humeri, lateral margins and suture, gray pollinose. Hairs white, short and sparse, on the posterior intermediate area black; central crest formed of sparse black bristles as long as antennal segments 1-2, becoming mostly white posteriorly. Bristles white, 2 presutural, 2 supraalar, 2 postalar. Pleura and coxae yellowish gray pollinose, hairs and bristles white. Scutellum yellowish gray pollinose, discal hairs short white and arranged in sparse clumps on either side, 8 white marginal bristles.

Abdomen black, yellowish gray pollinose, segments 6-7 white. Hairs sparse white, longer on sides of 1-4. Venter gray pollinose, hairs white, long on 1-2, short on remainder. Terminalia black, the lower forceps apically yellowish brown; hairs on surstyli white, short hairs dorsally and about 8 on ventral margin long black; lower forceps with sparse white hairs, ventral fringe brown, short and of nearly uniform width.

Femora black, tibiae and tarsi yellowish red, the tarsi becoming darker apically. Hairs and bristles white, bristles below on tarsi and apically on fore and middle tibiae black, hairs on outer tarsal segments black. Claws black, brownish basally; pulvilli and empodia light brown.

Halteres yellowish white, base of stem brown. Wings hyaline, veins brown, anterior crossvein at 32/51 length of discal cell, third vein with short stump vein, costa not dilated.

FEMALE. Length 16 mm. Two black hairs at tip on one of the palpi. Abdomen gray pollinose, hairs short white, longer on sides on 1-2 and a few black hairs on dorsum of 7; venter gray pollinose, hairs erect white on 1-3, shorter recumbent on 4-7 white; ovipositor black, 4.6 mm. long, at middle 1/7 as wide as long.

HOLOTYPE. Male, 6 mi. S.E. of Willcox, Cochise County, Arizona, 29 June 1955 (E. Ordway), AMNH.

ALLOTYPE. Female, Cienaga Lake, Hidalgo County, New Mexico, 20 June 1964 (J. H. Puckle), ASU, deposited in AMNH.

PARATYPES. 1 ♂, same data as holotype, AMNH; 1 ♀, Silver City, New Mexico, 24 June 1933 (R. T. Kellogg), JW; 1 ♀, Pecos, Texas, 15 May 1927 (J. O. Martin), CAS.

Named in honor of Ellen Ordway who has collected many Asilidae in Arizona and New Mexico as well as the holotype of this species.

The specimen from Texas has about 12 slender black bristles in the mystax.

***Efferia prolifica* (Osten Sacken).**

Erax prolificus OSTEN SACKEN, 1887, Biologia Centrali-Amer. Insecta. Diptera, vol. 1, p. 202.

Types male and female, Northern Sonora, Mexico (Morrison), BMNH.

Erax jubatus HINE, 1919, Ann. Entomol. Soc. Amer., vol. 12, p. 133, in part. He says, "A study of the variations in the specimens at hand suggest strongly that *prolificus* Osten

Sacken, is a synonym of *jubatus*." On page 106 he lists *E. prolificus* as a synonym. Hine may be right, the material available is quite limited but it seems worthwhile to call attention to this possible species.

Specimens from the following localities. *Arizona*: Mingus Mountain, 2 September 1959 (J. Wilcox); Santa Rita Mountains, Madera Canyon, 23 October 1962 (J. Wilcox). *New Mexico*: Silver City, 25 September 1933, 17 October 1935, 5 November 1932 (R. T. Kellogg).

MALE. Length 16 mm. Face 30/45 width of one eye, vertex 24, antennae measures 13-5-14-31. Mesonotal crest formed of black hairs subequal in length to antennal segments 1-2 with very few black bristles. Abdominal segments 2-4 black and mostly black haired, 5-7 white and white haired, long sparse on the sides. Wings tinged with brown, anterior crossvein at 40/56 length of discal cell, no stump vein, costa dilated and subcosta black.

FEMALE. Length 20 mm. Abdominal segments 2-7 black with black hairs, venter 1-7 with erect white hairs sometimes black on 7; ovipositor 4.8 mm. long, at middle 1/8 as wide as long.

Efferia subcuprea (Schaeffer).

Erax subcupreus SCHAEFFER, 1916, Jour. New York Entomol. Soc., vol. 24, p. 66. Type male, Prescott, Arizona (George Franck), USNM.

Erax subcupreus HINE, 1919, Ann. Entomol. Soc. Amer., vol. 12, p. 133. Description male and female, figure of male genitalia, records from Montana, Colorado, New Mexico, Arizona, and Nevada.

Specimens are recorded from the following localities. *Arizona*: Chiricahua Mountains, June (D. K. Duncan), 6,200 feet, 20 June 1928 (A. A. Nichol), National Monument, 8 July 1962 (J. Wilcox), Onion Saddle, 31 May, 9 June 1962 (J. Wilcox), Pinery Canyon, 5,000 feet, 15 June 1932 (D. K. Duncan) 6,500 feet, 31 May 1962 (J. Wilcox), Rustlers Park, 8,500 feet, 16 June 1932 (D. K. Duncan) 23 June 1964 (J. H. Puckle, M. Mortenson, M. A. Cazier), E. Turkey Creek, 6,500 feet, 16 June 1964 (J. H. Puckle, M. Mortenson, M. A. Cazier); 5 mi. N. of Carrizo, Highway U. S. 60, 28 June 1949 (J. Wilcox); Flagstaff, 18 June 1949 (Guy F. Toland, J. Wilcox); Graham Mountain, Arcadia F.C., 2 June 1962 (J. Wilcox); Huachuca Mountains, Miller Canyon, 26 June 1949 (J. Wilcox); Hualapai Mountains, 6,000 feet, 4 June 1962 (J. Wilcox); Kits Peak, 16 May 1962 (Earl G. Davis); McMillan, 28 June 1949 (J. Wilcox); Mingus Mountain, 27 May 1963, 17 June 1948, 3 July 1929 (M. W. Stone, J. Wilcox); Prescott, 28, 29 May 1963 (M. W. Stone, J. Wilcox); Ruby, Sycamore Canyon, 26 May 1962 (J. Wilcox); San Carlos Lake, August (D. K. Duncan); Santa Catalina Mountains, 18 June 1933 (Owen Bryant) Lot 282; Santa Rita Mountains, 4,000 feet, 22 June 1932 (D. K. Duncan); Sierra Ancha Mountains, Hegler Creek, July 1930 (D. K. Duncan); White Mountains, N. Fork White River, Williams Creek, 6,000 feet,

4 June 1932 (D. K. Duncan), Diamond Creek, June (D. K. Duncan). *Nevada*: Antelope Summit, Highway U. S. 50, 10 June 1958 (J. Wilcox). *New Mexico*: Hidalgo County, 6 June 1935 (R. T. Kellogg); Luna County, 11 July 1933 (F. H. Parker); Silver City, 1 July 1932 (R. T. Kellogg); Tajique, 25 June 1931 (J. G. Shaw).

MALE. Length 16 mm. Face at antennae 32/43 width of one eye, vertex 25, antennae measure 12-5-13-27. Mesonotal crest formed of erect black hairs as long as antennal segments 1-2 with some longer black bristles curved backward. Broad base of abdominal segments 2-3 and 4 narrowly black, posterior margins 2-3 and 4-6 white pollinose, 2-6 with white parted hair, 7 black with short black hairs; venter with erect white hairs. Tibiae and tarsi brown. Wings hyaline, veins black, anterior crossvein at 43/58 length of discal cell, no stump vein, costa dilated subcosta brownish black.

FEMALE. Length 20 mm. Broad sides and narrow posterior margins of abdominal segments 2-7 grayish pollinose, 2-4 with fine erect white hairs, 5-7 with short black hairs; venter subshining with erect white hairs; ovipositor 5.7 mm. long, at middle about 1/10 as wide as long.

***Efferia willistoni* (Hine).**

Erax willistoni HINE, 1919, Ann. Entomol. Soc. Amer., vol. 12, p. 110, figure of male genitalia. Types male and female, Williams, Arizona, July 21 (H. Barber), USNM. Reports other specimens from Colorado, Arizona, and Chihuahua, Mexico (Tucker, Barber, Townsend).

Specimens are known from the following localities. *Arizona*: Cochise, Coconino, Gila, Graham, Navajo, Pima, Santa Cruz, and Yavapai counties, June to September but mostly collected in July and August. *New Mexico*: Grant and San Miguel counties, July.

MALE. Length 19 mm. Mystax long dense black with white hairs intermixed; face 42/52 width of one eye, vertex 30; antennae measure 15-6-16-37. Mesonotum gray pollinose, central stripe and intermediate spots black; hairs black erect, anteriorly as long as antennal segment 1, at suture twice this long and posteriorly longer; some white hairs on humeri and posteriorly; bristles black. Scutellum gray pollinose, hairs erect white and as long as antennal segments 1-2, 9 black marginal bristles. Abdominal segment 1 and narrow sides of 2-4 gray, 5-7 white pollinose, 2-4 black dorsally; hairs white, longer on sides of 1-3; venter 1-5 gray pollinose, 6-7 white, all with erect white hairs; 8 black with yellowish hairs. Terminalia black with black hairs; surstyli long slender, notched at apex; fringe brown, as long as antennal segment 1. Femora black, tips and the tibiae and tarsi reddish brown. Wings hyaline, veins brown, anterior crossvein at 48/66 length of discal cell, very short stump vein, costa dilated, subcostal cell brown.

FEMALE. Length 21 mm. Narrow sides and posterior margins of abdominal segments 2-7 grayish pollinose, dorsum black with short black

hairs, sides of 1-3 longer yellowish; venter gray pollinose with erect white hairs, partly black on 7; ovipositor black, slender, 5.7 mm. long, at middle $1/10$ as wide as long.

Hine 1919 listed the types as 22 and 23 mm. long and the male with abdominal segments 5-7 white pollinose as described above. A few male specimens have only abdominal segments 6-7 white pollinose, while others have 4-7, 3-7 and 2-7 (2 apically) white pollinose and with white parted hairs. The smaller specimens, some only 13 mm. long, seem to have more of the abdominal segments white pollinose, while the larger ones have only the last 2 or 3 segments white pollinose and on these the white hairs are short.

POGONIAS GROUP (Rufibarbis Group, Caudata Group)

Hine (1919) defines this group as follows (his Rufibarbis Group). "The females of this group differ from all other species by having the last segment of the oviduct divided at the tip. This character is easily seen from dorsal view. The mesothorax and scutellum is unusually bristly, the third vein branches beyond the middle of the distance between the base of the second posterior cell and the small crossvein. The male has abdominal segments six and seven silvery. The oviduct is rather short and rigid and the hypopygium is rather small. Mystax without or with very few black bristles."

The cerci (end lamellae) of the ovipositor are heavily chitinated, pointed apically and split dorsoventrally. The ninth tergite is broader than long and the dorsal margin is subequal in length or shorter than the cerci. In the other groups, the cerci are rounded apically and are usually shorter than tergite 9 and tergite 9 is usually longer than wide (high). Males without long parted hairs on the abdomen, segments 2-5 brownish or black dorsally and 6-7 white pollinose; exception *E. pilosa* (Hine) with the abdomen white pollinose and white parted hairs on segments 2-7. Bristles of the tibiae and tarsi black; partly white in *E. pilosa*. Median line of the mesonotum with a crest of bristly hairs, curved backward anteriorly, straighter and longer posteriorly; as long and dense as some species of the Carinata Group but never with the costa dilated. *Efferia pilosa* with short hairs anteriorly on the mesonotum.

Wings with two submarginal cells, third vein branched before end of discal cell (base of second posterior cell or discal crossvein). *Efferia completa* (Macquart) and *E. bryanti*, new species belong in this group and are included in the key, they are discussed in the Anomala Group because of the three submarginal cells. Bromley (1951) noted that in *E. completa* the presence of three submarginal cells was the rule, while in *E. pogonias* (*rufibarbis*) it was exceptional. In a series of 110 specimens of *E. bicaudata*, one had three submarginal cells in both wings and two had three submarginal cells in one wing.

Martin (1962) proposed the name *Caudatus* for this group but at that time he considered *E. barbatus* to be the valid name of *E. pogonias* (*rufibarbis*).

KEY TO THE SPECIES OF THE POGONIAS GROUP—MALES

1. Three submarginal cells in the wings 2
Two submarginal cells 3
2. Femora black; terminalia black, in dorsal view wider apically than at base, surstyli with dense long black hairs on the apical half ventrally; length 16-30 mm. (Mexico, Texas) *E. completa* (Macquart)
Dorsum of femora usually reddish; terminalia largely reddish, not wider apically in dorsal view, surstyli with white hairs laterally and not more than 6 longer black bristles ventrally; length 17-24 mm. (Arizona) *E. bryanti*, new species
3. Abdominal segments 2-7 gray pollinose and with white parted hair; length 11-16 mm. (New Mexico, Texas) *E. pilosa* (Hine)
Abdominal segments 2-5 brown or blackish basally, 6-7 silvery, without white parted hair on any segments; larger species 4
4. Scutellar bristles black 5
Scutellar bristles largely or in part white 7
5. Scutellar hairs largely white; dorsum of abdominal segments 1-4 and venter of 2-3 with black hairs; length 14-25 mm. (Alberta, California, Nevada, Oregon, Utah, Washington) *E. frewingi*, new species
Scutellar hairs black; dorsum of abdominal segments 1-5 and venter of 2-5, black haired 6
6. Mystax yellow, usually a few black bristles below laterally; surstyli usually all black haired, sometimes yellowish haired laterally; length 18-27 mm. (Eastern States, west to Minnesota, Texas) *E. pogonias* (Wiedemann)
Mystax white, usually with black bristles above and below laterally; surstyli white haired laterally; length 19-28 mm. (Arizona, Mexico, New Mexico)
..... *E. kelloggi*, new species
7. At least some of the hairs at base of scutellum white 8
Discal hairs of scutellum black, sometimes a few white laterally 9
8. Mystax white; scutellar hairs white and bristles usually all white; abdomen all white haired; length 18-26 mm. (Utah) *E. utahensis* (Bromley)
Mystax usually with a few black hairs or bristles below; scutellar hairs usually in part black; at least abdominal segments 1-2 with black hairs dorsally; length 14-23 mm. (Alberta, Colorado, Montana, New Mexico, Texas) *E. bicaudata* (Hine)
9. Mystax white with 4-5 black bristles below laterally; occipital bristles usually black above; dorsum of abdominal segments 1-4 or 5 black haired and usually venter of 2-3; length 18-31 mm. (Arizona, Colorado, New Mexico, Texas)
..... *E. helenae* (Bromley)
Mystax all white, at most 1-2 black bristles below; occipital bristles whitish; venter of abdomen white haired 10
10. Scutellar hairs subequal in length to antennal segment 1; anterior mesonotal crest subequal in length to antennae 1; length 19-26 mm. (Arizona) .. *E. cabeza*, new species
Scutellar hairs longer than antennal segments 1-2; anterior mesonotal crest as long as antennae 1-2; length 16-29 mm. (Arizona, New Mexico)
..... *E. mortensoni*, new species

KEY TO THE SPECIES OF THE *POGONIAS* GROUP—FEMALES

1. Three submarginal cells in the wings 2
Two submarginal cells 3
2. Femora black; ovipositor 4.8 mm. long, without spines at the tip *E. completa*
Femora usually reddish dorsally; ovipositor 4.0 mm. long, with small spines above
on cerci *E. bryanti*
3. Mesonotum anteriorly with hairs shorter than antennal segment 2; abdomen gray
pollinose, ovipositor 2.6-2.8 mm. long *E. pilosa*
Mesonotum anteriorly with hairs at least as long as antennal segment 1; ovipositor
at least 4.0 mm. long 4
4. Scutellar bristles all or largely black 5
Scutellar bristles all white 7
5. Mystax yellow; dorsum of abdominal segments 1-7 and at least venter of 2-3, black
haired; ovipositor 4.1 mm. long *E. pogonias*
Mystax white 6
6. Mystax with 8-16 black bristles; venter of abdomen white haired, dorsum sometimes
with black hairs narrowly on center line; ovipositor 4.7 mm. long *E. frewingi*
Mystax usually with more than 20 black bristles; venter of abdominal segments 2-5
or more with a few coarse black hairs, dorsum of 1-7 or 2-7 black haired; ovipositor
4.2 mm. long *E. kelloggi*
7. Anterior mesonotal crest subequal in length to antennae 1; discal hairs of scutellum
shorter than antennae 1, largely white; ovipositor 4.6 mm. long *E. cabeza*
Anterior mesonotal crest as long or longer than antennae 1-2; scutellar hairs as long
as antennae 1-2 8
8. Dorsum of abdomen at least in part black haired 9
Abdomen all white haired 10
9. Usually only abdominal segments 6-7 narrowly black haired dorsally; mystax all
white; ovipositor 4.6 mm. long *E. mortensoni*
Abdominal segments 1-7 usually broadly black haired; 3-4 black bristles and a few
black hairs below in mystax; ovipositor 4.2 mm. long *E. helenae*
10. Fore and middle tibiae and tarsi usually all reddish; ovipositor 4.6 mm. long
..... *E. bicaudata*
Fore and middle tibiae and tarsi black, basal half of tibiae brownish dorsally; ovi-
positor 4.0 mm. long *E. utahensis*

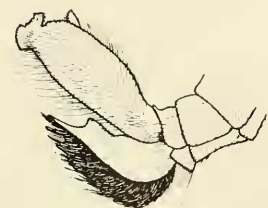
Efferia bicaudata (Hine).

Erax bicaudatus HINE, 1919, Ann. Entomol. Soc. Amer., vol. 12, p. 138. Type male, Montclair, Colorado, July 30, 1898, female, Morrison, Colorado, May 20, 1898, OSU.

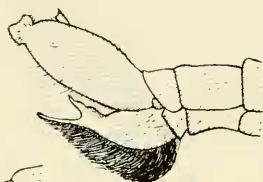
Bromley (1934) reports this species from Texas but the few specimens available from Texas that he determined as belonging to this species have been placed in *E. helenae*.

James (1941) says, "our most common fall *Erax*" and records it from many localities, late July to October. He questions the May collecting date for the type female.

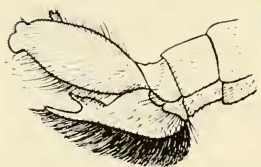
Specimens are known from the following localities. *Alberta*: Medicine Hat, 18 July to 10 September 1932 (F. S. Carr); *Colorado*: Montclair, 30



111. HELENÆ



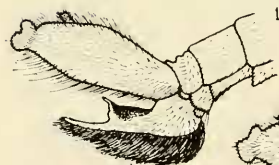
114. CABEZA



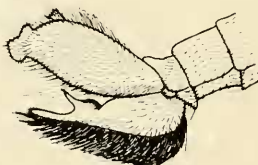
116. UTAHENSIS



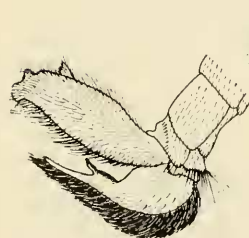
118. POGONIAS



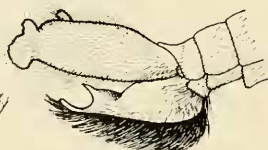
120. MORTENSONI



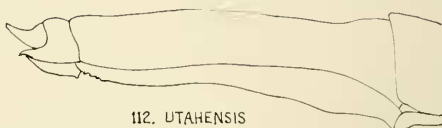
122. KELLOGGI



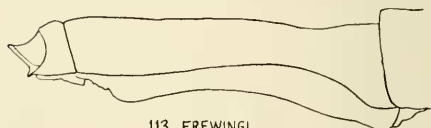
124. BICAUDATA



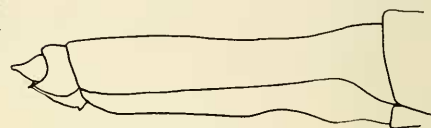
126. FREWINGI



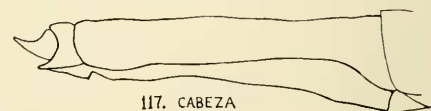
112. UTAHENSIS



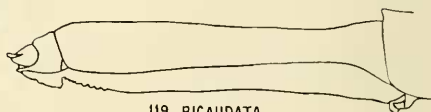
113. FREWINGI



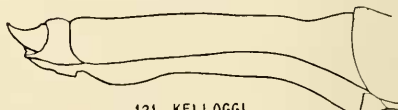
115. MORTENSONI



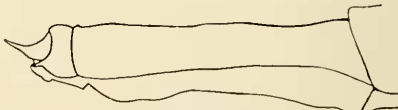
117. CABEZA



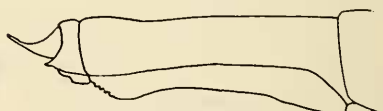
119. BICAUDATA



121. KELLOGGI



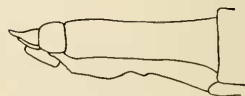
123. HELENÆ



125. POGONIAS



127. PILOSA



128. PILOSA

July 1898; *Montana*: Jefferson County, 29 August 1929, E-29, 705; Whitehall, 13 August 1931 (R. H. Beamer); *New Mexico*: Montaya, Quay County, 7 September 1951 (A. T. McClay); Torrance County, September 1925 (C. H. Martin); *Texas*: 45.5 mi. E. of El Paso, Hudspeth County, October 1962 (P. H. Timberlake).

MALE. Mystax white, 19 black bristles and a few black hairs below; face at antennae 43/49 width of one eye, vertex 39; frons with white and black hairs; 7 black bristles on ocellar tubercle; 9 black occipital bristles on each side above, others yellowish. Antennae black, gray pollinose, hairs white, segments measure 17-8-20-29.

Mesonotal crest subequal in length to antennae 1-2; short hairs black, white on humeri and margins. Bristles brownish to black, no anterior dorso-central. Scutellar bristles black (4 brownish); hairs black, white anteriorly.

Abdominal segments 1-5 brownish, 6-7 white pollinose; hairs white, longer on 1-3, dorsum 1-3 with short black hairs. Venter erect white haired, in part black on 2-3. Eight grayish pollinose, hairs white, longer on posterior margin of sternite. Terminalia reddish brown, sides of surstyli brown, base of lower forceps black; hairs white, black on dorsum of surstyli; fringe brown, margined with dense white hairs, basally as long as antennae 1-2 and gradually narrowing to apex where it is subequal in length to antennae 1.

Male specimen labeled, Montclair, Colorado, 7-30-98, apparently from the type series, determined by Hine (1929).

←

FIGURE 111-128. *Pogonias* Group, lateral view of the male terminalia and ovipositor of the *Efferia* species.

111. *E. helenae* (Bromley), male terminalia.
112. *E. utahensis* (Bromley), ovipositor.
113. *E. frewingi*, new species, ovipositor.
114. *E. cabeza*, new species, male terminalia.
115. *E. mortensoni*, new species, ovipositor.
116. *E. utahensis* (Bromley), male terminalia.
117. *E. cabeza*, new species, ovipositor.
118. *E. pogonias* (Wiedemann), male terminalia.
119. *E. bicaudata* (Hine), ovipositor.
120. *E. mortensoni*, new species, male terminalia.
121. *E. kelloggi*, new species, ovipositor.
122. *E. kelloggi*, new species, male terminalia.
123. *E. helenae* (Bromley), ovipositor.
124. *E. frewingi*, new species, male terminalia.
125. *E. pogonias* (Wiedemann), ovipositor.
126. *E. bicaudata* (Hine), male terminalia.
127. *E. pilosa* (Hine), male terminalia.
128. *E. pilosa* (Hine), ovipositor.

Male specimens from Alberta and Montana have the mystax, lateral mesonotal bristles and scutellar bristles, all or largely white; and the abdominal hairs all white. Males from New Mexico, have many bristles in the mystax and most of the lateral mesonotal and scutellar bristles, black; and the dorsum of abdominal segments 1-5, and venter of 2-3, black haired.

Female specimens vary about the same, in addition the posterior dorso-centrals are largely white in the northern specimens and the abdomen is white haired with a few specimens with black hairs narrowly on the dorsum of segments 5-7. There are more whitish or brownish bristles on the mesonotum and scutellum of the southern females but the dorsum of abdominal segments 2-7 are narrowly black haired.

Efferia cabeza Wilcox, new species.

MALE. Length 22 mm. Head black, gray pollinose, thinly so on frons. Mystax white, bristles on oral margin yellowish plus 1 black bristle and 2 black hairs; face at antennae 42/51 width of one eye, vertex 36. Frons white haired; ocellar tubercle with 4 black bristles and several black hairs; occipital bristles yellow; beard, hairs on proboscis and below on palpi white, apically on palpi black. Antennae black, gray pollinose; hairs white; segments measure 16-9-16-31.

Mesonotum black, yellowish gray pollinose, central stripe and intermediate area brown at certain angles. Hairs black, anteriorly on central stripe not longer than antennae 1; a few on humeri, and anterior and lateral margins white. Bristles white, 3 presutural, 2 supraalar (1 black), 3 postalar. Pleura yellowish gray pollinose, hairs white, bristles yellowish white. Scutellum yellowish gray pollinose; hairs black with a few white intermixed, in length subequal to antennae 1; 9 white and 7 black marginal bristles.

Abdomen black, yellowish brown pollinose, dorsum of 2-5 appearing black, 6-7 white pollinose. Hairs short white, longer laterally on 1-5, dorsum 1-5 with short black hairs. Venter grayish brown pollinose, 6-7 white; hairs long erect white on 1-3, shorter on 4-5, very short on 6-7. Eight grayish white pollinose, hairs white, long on posterior margin of sternite. Surstyli brownish black, hairs white, black at middle dorsally; lower forceps brownish black, hairs white, fringe black but almost concealed by dense margin of white hairs, as long as antennae 1-2 except at apex.

Legs black, fore and middle tibiae brownish basally. Hairs white, short black hairs anteriorly on fore femora and a few on middle femora. Bristles black, several on femora, anterior tibiae and tarsi, white. Claws black, base reddish; empodia and pulvilli light brown.

Halteres yellowish brown, knob darker. Wings hyaline, veins black, anterior crossvein at 36/68 length of discal cell, third vein branched at 25/32 distance from anterior to discal crossvein.

FEMALE. Length 25 mm. Hairs on head white except on palpi, bristles yellowish. Short hairs on humeri white, bristles yellowish including posterior dorsocentral. Scutellar hairs half white and black, bristles yellowish. Abdomen grayish yellow pollinose, hairs white, 3-4 black at middle of segment 1. Venter grayish pollinose, hairs erect white on 1-5, shorter on 6-7. Ovipositor black, 4.7 mm. long. All tibiae yellowish red basally; bristles on fore femora and mostly on middle femora, yellowish. Anterior crossvein at 38/70 length of discal cell, third vein branched at 26/32 distance from anterior to discal crossvein.

HOLOTYPE. Male, 4 mi. SE. of Willcox, Arizona, 15 September 1962 (J. Wilcox), CAS.

ALLOTYPE. Female, same data (Itol J. Wilcox).

PARATYPES. 25 ♂♂, 16 ♀♀, same data and 21 September 1962; 1 ♀, Dry Lake, Willcox, Cochise County, Arizona, 6 September 1960 (P. M. Marsh), UCD.

Efferia frewingi Wilcox, new species.

MALE. Length 20 mm. Head black; gray pollinose, thin on gibbosity and frons with yellowish tinge. Mystax white, about 30 slender black bristles on sides and mixed in above; face at antennae 38/43 width of one eye, vertex 30; hairs on frons white with about 6 black; 6 black bristles on ocellar tubercle; occipital bristles largely black; beard, hairs on proboscis and below on palpi white, above on palpi black. Antennae black, thinly brownish pollinose; hairs on segment 1 black and white, on 2 white; segments measure 11-11-17-30.

Mesonotum black, light yellowish brown pollinose, the divided central stripe and intermediate spots appearing black. Hairs black, anteriorly in central stripe 1 1/2 times antennae 1-2; partly white on humeri and lateral margins. Bristles black, 3 presutural, 2-3 supraalar, 2-3 postalar, 6-7 slender posterior and 4-5 anterior dorsocentral. Pleura and coxae thinly yellowish brown pollinose, hairs and bristles white, a few black hairs on mesopleura and 8-9 black hypopleural bristles. Scutellum thinly yellowish brown pollinose, discal hairs white with a few longer black posteriorly, 20 black marginal bristles.

Abdomen black, segments 1-5 yellowish brown pollinose the dorsum appearing black, 6-7 white pollinose. Hairs white, longer on sides of 1-3, dorsum 1-5 black. Venter brownish pollinose, 6-7 white; hairs white, erect on 1-4 with some black on 2-4. Tergite 8 brownish pollinose, hairs short white; sternite black with margin of long white hairs. Surstyli largely reddish brown, hairs white, dorsally short black; lower forceps black, white haired, fringe brownish black, basally as long as antennae 1-2 and narrowing apically, bordered with sparse white hairs.

Legs black, tibiae largely reddish. Bristles black; hairs on femora largely white with short black above and longer below; tibiae white haired with some black below; fore and middle tarsi mostly white haired, hind ones mostly black. Claws black, base reddish; empodia and pulvilli light brownish.

Halteres brown, stem and base lighter. Wings hyaline, veins brown, anterior crossvein at 31/59 length of discal cell, third vein branched at 22/28 distance from anterior to discal crossvein.

FEMALE. Length 22 mm. Mystax white with about 4 black bristles and a few black hairs below; hairs on frons and antennae white; occipital bristles white (3 black). Hairs on humeri, anteriorly and a few posteriorly on mesonotum, white. Pleural hairs and bristles white. Scutellar hairs and bristles white (3 black). Abdomen all white haired, erect on venter 1-7. Ovipositor black, 4.0 mm. long. Hairs on legs and several bristles basally on femora white. Third vein branched just before end of discal cell.

HOLOTYPE. Male, Antelope Mountain, Harney County, Oregon, 6,500 feet, 9 August 1931 (D. K. Frewing), CAS.

ALLOTYPE. Female, same data, 13 August 1931.

PARATYPES. 28♂♂, 40♀♀, same data, 6 to 28 August 1931; 160♂♂, 106♀♀, same locality but Grant County, Oregon, 10 to 14 August 1932; 1♂, 3♀♀, Prairie Hill, Grant County, Oregon, 6,000 feet, 20 August 1932. All collected by and named for Darrell K. Frewing who collected several thousand robber flies for me in 1931 and 1932.

Specimens collected from the following localities but not designated as paratypes. *Alberta*: Medicine Hat, 25 July to 10 September 1932 (F. S. Carr). *California*: Lava Beds, National Monument, 24 August 1940 (T. Aitken). *Nevada*: Connor Pass, 11 September 1963 (J. Wilcox); 16 mi. E. of Ely, 11 September 1963 (J. Wilcox); 28 mi. SW. of Hawthorne, Pole Line Summit, 13 September 1963 (J. Wilcox); Montgomery Pass, 14 September 1963 (Itol J. and J. Wilcox). *Utah*: 3 mi. W. of Long Valley Junction, 6, 8 September 1963 (Itol J. and J. Wilcox). *Washington*: Washington Ty.

Some of the females have a few black bristles above in the mystax; scutellar bristles black, discal hairs white; and narrow dorsum of abdominal segments 2-7 with short black hairs.

The specimens vary from 14 to 27 mm. in length including the ovipositor.

Efferia helenae (Bromley).

Erax helenae BROMLEY, 1951, Amer. Mus. Novitates, no. 1532, p. 30. Type male, Masters, Colorado, 4,500 feet, September 18, 1938 (E. B. Andrews), female, Masters, Colorado, 4,300 feet, September 3, 1938 (E. B. Andrews), USNM. Paratypes from *Colorado*: Calhan, August 19, 1936 (J. D. Beamer); Loveland, dry creek, 5,200 feet, September 12 to 22, 1937 (E. B. Andrews); Masters, 4,300 feet, September 3 to 17, 1939 (E. B. Andrews); Orchard, 4,500 feet, September 28, 1938 (E. B. Andrews); Parshal, August 19, 1936 (W. D. Field).

Bromley (1951) says, "Total length, 22-31 mm. A pale yellowish, tan-colored pollinose and pruinose species of the *Rufibarbis* Group, . . . Differs from *Erax bicaudatus* Hine in the much paler pollen and by having a larger proportion of the bristles of the posterior part of the mesonotum and scutellum whitish or pale yellowish."

Specimens are known from the following localities. *Arizona*: Pinery Canyon, Chiricahua Mountains, 27 September 1960 (M. A. Cazier); 2 mi. NE. of Portal, 23 October 1962 (Itol J. Wilcox), 26 October 1961 (M. A. Cazier); Willcox, 23 September 1955 (P. H. Timberlake), 4 mi. SE., 15 September, 21 October 1962 (Itol J. and J. Wilcox). *Colorado*: Atwood, 19 September 1931; Colorado Springs, 27, 30 August 1960 (S. Camras); Fort Collins, 16 September 1916; Fort Valley School, 6,000 feet, August 1932 (C. Lynn Hayward) 257; Masters (paratype and topotypes); Orchard (paratype). *Kansas*: Scott City, 1 October 1935. *Manitoba*: Aweme, 5 August 1920 (P. N. Vroom). *New Mexico*: Albuquerque, 3 October 1909; 16.5 mi. W. of Caprock, 3 October 1962 (C. S. Papp, P. H. Timberlake); Montaya, Quay County, 7 September 1951 (M. F. and A. T. McClay); Moriarity, Torrance County, 7 September 1951 (A. T. McClay); Rio Puerco, Bernillo County, 8 September 1951 (A. T. McClay); Silver City, 16 September 1932 (R. T. Kellogg); Tatum, 25 August 1938 (R. P. Allen); Torrance County, September 1925 (C. H. Martin). *Texas*: Marfa, 7 October 1935; Miami, Roberts County, 6 September 1951 (A. T. McClay); Van Horn, 1 October 1935; Ware, Dallas County, 27 August 1921 (C. D. Duncan).

This species is closely related to *E. pogonias* and may be only a western form; the male terminalia are similar. Differs from *E. pogonias* by having the mystax white with 4-5 black bristles and a few black hairs below; scutellar bristles largely white, discal hairs black; abdominal tergite 1-5 largely white haired with a few short black hairs on the dorsum, venter of 1-5 with erect white hairs. Terminalia yellowish red, surstyli white haired except dorsum narrowly black haired; lower forceps white haired, fringe brown with margin of dense white hairs and subequal in length to antennae 1-2. Face at antennae 50/53 width of one eye, vertex 38; antennal segments measure 21-10-23-31. Anterior crossvein at 35/71 length of discal cell, third vein branched at 25/35 distance from anterior to discal crossvein.

The Colorado specimens have most of the mesonotal hairs, other than the crest, white; the southern specimens have most of these hairs black. Southern specimens in a few cases have the scutellar bristles black; frequently sternites 2-3 have black hairs; and the terminalia is black instead of reddish. As this species is collected in the same localities as *E. bicaudata* and other species which also vary, it is usually necessary to examine the lower forceps of the male to be certain. Females in these situations are very difficult to separate.

As mentioned under *E. bicaudata* several specimens determined as *E. bicaudata* from Texas by Bromley are here included in *E. helenae*.

***Efferia kelloggi* Wilcox, new species.**

MALE. Length 27 mm. Head black, gray pollinose, gibbosity and frons yellowish. Mystax white, bordered with black hairs, the white hairs yellowish basally; face at antennae 46/50 width of one eye, vertex 38. Hairs on frons black and white; 7 black bristles on ocellar tubercle; occipital bristles black, hairs white, a few white bristles below; beard, hairs on proboscis and below on palpi, white; palpi largely black haired. Antennae black, segment 1 black and white haired, 2 black haired; segments measure 22-10-22-31.

Mesonotum black, golden brown pollinose with indications of gray in central and dorsocentral stripes and tranverse suture. Hairs black, central anterior crest formed mostly of bristles as long as antennae 1-2, at suture as long as antennae 1-3; a few white hairs on anterior and lateral margins and anteriorly on humeri. Bristles black, 3 presutural, 2 supraalar, 4 postalar, 8-9 posterior and 5-6 anterior slender dorsocentral. Pleura and coxae brownish pollinose; hairs white, a few black on sterno- and mesopleura; bristles white, yellowish basally; hypopleura with about 12 slender black bristles. Scutellum brownish pollinose, hairs black and 2/3 length of bristles, about 24 black marginal bristles.

Abdomen golden brown pollinose, segments 1-5 dorsally black, 6-7 white. Hairs mostly black on 1-5, a few white laterally, 6-7 short white. Venter 1-5 erect black haired, a few short white on 4-5; 6-7 short white with a few black on 6. Terminalia black, hairs white; dorsum of surstyli black haired and ventral margin with sparse long black hairs; fringe black, margined with sparse white hairs, subequal in length to antennae 1. Eight gray pollinose, tergite with short black and sternite with long white hairs posteriorly.

Legs black, fore and middle tibiae brownish basally. Bristles black. Hairs white; hind femora largely and fore and middle ones dorsally and ventrally black haired; fore tibiae with short black and white hairs dorsally and anteriorly, posteriorly with long white and ventrally with long black; middle tibiae with a few black ventrally at base; hind tibiae with black hairs mixed with white ventrally; fore tarsi mostly white haired, middle and hind tarsi mostly black haired. Claws black; empodia and pulvilli brownish.

Halteres brown. Wings hyaline, veins black, anterior crossvein at 35/72 length of discal cell, third vein branched opposite end of discal cell.

FEMALE. Length 24 mm. Fewer black bristles in mystax; occipital bristles yellowish (1 black). Mesonotal crest sparse and formed mainly of bristles; more white hairs anteriorly on humeri; about half of lateral bristles yellowish. Pleural hairs white, bristles yellowish. Scutellar hairs white, bristles yellowish (1 black bristle, 3 black hairs). Abdomen with short black

hairs dorsally on 1-7; venter with a few black hairs on 4-7. Ovipositor black, 4.3 mm. long. Tarsi and hind tibiae mostly black haired. Anterior cross-vein at 35/68 length of discal cell, third vein branched at 28/33 distance from anterior to discal crossvein.

HOLOTYPE. Male, Chiricahua National Monument, Arizona, 21 October 1962 (J. Wilcox), CAS.

ALLOTYPE. Female, same data (Itol J. Wilcox).

PARATYPES. *Arizona:* 23 ♂♂, 17 ♀♀, same data and 22 October 1962, JW; 1 ♀, Chiricahua Mountains, 7 October 1932 (E. D. Ball), JW; 1 ♂, 3 ♀♀, Chino Valley, Yavapai County, 30 September 1961 (C. Crosswhite, Jack Strong), ASU; 4 ♂♂, 7 ♀♀, Flagstaff, 9 September 1951 (A. T. and M. F. McClay), UCD; 1 ♀, 14 September 1933 (R. T. Kellogg), JW; 2 ♂♂, Pine Forest, 4 mi. SW. of Forestdale, Navajo County, 23, 24 August 1952 (H. B. Leech, J. W. Green), CAS; 12 ♂♂, 3 ♀♀, Pinery Canyon, Chiricahua Mountains, 27 September 1960 (M. A. Cazier), ASU; 1 ♂, Showlow, Navajo County, 5 September 1957 (T. R. Haig), UCD; 1 ♂, Two Gun, Coconino County, 19 September 1951 (A. T. McClay), UCD. 1 ♂, 1 ♀, *Mexico:* Near Chihuahua, 30 November 1951 (I. J. Condit) on *Baileya*, UCR. *New Mexico:* 1 ♀, Grant County, 24 September 1933 (R. T. Kellogg), JW; 10 ♂♂, 5 ♀♀, Silver City, 11 to 16 September 1932 (R. T. Kellogg), JW.

Named for R. T. Kellogg of Silver City, New Mexico, who collected a large number of robber flies for me in the 1930's.

***Efferia mortensoni* Wilcox, new species.**

MALE. Length 24 mm. Head black; face white, frons and occiput gray pollinose. Mystax white, bristles yellowish and 2 black hairs below on one side; face at antennae 47/49 width of one eye, vertex 40. Frons white haired; 2 white and 2 black bristles on ocellar tubercle and several black hairs; occipital bristles yellowish (1 black) on one side; beard and hairs on proboscis white; hairs on palpi largely black. Antennae black, grayish pollinose; hairs white; segments measure 16-8-20-32.

Mesonotum black, brownish gray pollinose, central stripe and intermediate area brown at some angles. Hairs black, central crest anteriorly as long as antennae 1-2; hairs in part on humeri, and on anterior and lateral margins, white. Bristles white, 3 presutural, 2 supraalar (1 black), 3 postalar, dorsocentrals black and hard to separate from the long hairs posteriorly. Pleura and coxae brownish pollinose, hairs white, bristles yellowish white. Scutellum yellowish brown pollinose, hairs black and nearly as long as bristles, 18 white marginal bristles.

Abdomen black, brownish pollinose, dorsally appearing black, 6-7 white pollinose. Hairs white, long on sides of 1-4 and posterior margins of 2-3, dorsum 1-5 short black haired. Venter brown pollinose, hairs white, long

erect on 1-5. Eight gray pollinose, hairs white, ventral row long. Terminalia black; hairs white, black dorsally on surstyli; fringe black, partly obscured by white hairs, at base 2 times length of antennae 1 and gradually shortening apically.

Legs black; bristles black, a few on femora, fore tibiae and middle tarsi and fore tarsi largely, white. Hairs white, dorsally on femora, anteriorly on fore femora, below on hind femora, fore tarsi partly and middle and hind tarsi largely, black. Claws black; empodia and pulvilli light brownish.

Halteres light brown, knob darker. Wings hyaline, a slight yellowish along veins, veins brown, anterior crossvein at 42/74 length of discal cell, third vein branched at 28/32 distance from anterior to discal crossvein.

FEMALE. Length 23 mm. Hairs white, on palpi and a few on ocellar tubercle and upper occiput black; bristles yellowish. Humeri wholly short white haired and white hairs more numerous on anterior and lateral margins. Bristles white, about 10 posterior dorsocentral. A few white hairs among the black on scutellum, about 16 white marginal bristles. Abdomen brown pollinose; hairs white, a narrow row of short black dorsally on 1-7. Venter brownish pollinose; hairs white, fine erect on 1, coarse erect on 2-7. Ovipositor black, 4.1 mm. long. Middle and hind femora almost all white haired, fore tarsi black haired. Anterior crossvein at 34/65 length of discal cell.

HOLOTYPE. Male, 2 mi. NE. of Portal, Arizona, 23 October 1962 (J. Wilcox).

ALLOTYPE. Female, same data (Itol J. Wilcox).

PARATYPES. 15 ♂♂, 23 ♀♀, same data and 24 October 1962, JW; 2 pair, 10 ♂♂, 11 ♀♀, same locality, 3 September to 5 October 1960, 21 September and 6 October 1963 (M. A. Cazier), ASU; 2 ♀♀, 4 mi. W. of Portal, Arizona, 22 October 1962 (J. Wilcox), JW; 1 ♂, 4 mi. E. of Portal, Arizona, 19 September 1962 (J. Wilcox), JW; 10 ♂♂, 17 ♀♀, 7 mi. E. of Portal, Arizona, 18, 19 September, 23 October 1962 (Itol J. and J. Wilcox), JW; 1 ♂, 1 ♀, 7 mi. S. of San Simon, Arizona, 1 ♂, 5 mi. S., 25 October 1962 (J. Wilcox), JW; 1 ♀, 2 mi. N. of Rodeo, New Mexico, 28 September 1960 (M. A. Cazier), ASU; 2 ♂♂, 5 ♀♀, Silver City, New Mexico, 9 September 1933 (R. T. Kellogg), JW.

Named for Martin A. Mortenson who has photographed this fly with and without prey and who has collected many robber flies in the vicinity of Portal, Arizona.

Efferia pilosa (Hine).

Erax pilosus HINE, 1919, Ann. Entomol. Soc. Amer., vol. 12, p. 150, figure of male genitalia.

Type male, El Paso, Texas, April 5, 1902, ANSP.

Specimens are known from the following localities in *New Mexico*: 11 mi. S. of Animas, 27 July 1963 (M. A. Mortenson); 1 mi. N. of Rodeo, 26

July 1963 (M. A. Mortenson); Silver City, 14 to 28 July 1933, 5 to 25 August 1935 (R. T. Kellogg); 3 mi. N. of Three Rivers, 16 May 1965 (J. Wilcox); White Sands, 7 June 1933, 23 July 1933 (R. H. Beamer, W. Benedict).

Male abdomen white pollinose with white parted hairs on segments 2-7 and placed in the Staminea Group by Hine where it belongs if only male characters are considered.

FEMALE. Length 16 mm. Head black, gray pollinose. Hairs and bristles white except 4-5 upper occipitals black. Face at antennae 28/35 width of one eye, vertex 21. Antennae black, hairs white, segments measure 11-5-15-20.

Mesonotum black, yellowish gray pollinose. Hairs black, anteriorly shorter than antennae 2; hairs on humeri, anterior and lateral margins white. Bristles white, 2 presutural (1 black), 3 supraalar (1 black), 2 postalar, 5 posterior dorsocentral. Pleura black, coxae reddish, yellowish gray pollinose, hairs and bristles white. Scutellum yellowish gray pollinose, short discal hairs and 9 marginal bristles white.

Abdomen black, gray pollinose, hairs short white; lateral bristles on 1 and a posterior row on 2-4 white; 7 bare dorsally with short black hairs; ovipositor black, 2.8 mm. long.

Base and apex of femora, tibiae and tarsi yellowish red, femora otherwise brownish black; hairs largely white; bristles on femora largely and posteriorly on fore tibiae white, otherwise largely black.

Wings hyaline, veins brown, anterior crossvein at 23/48 length of discal cell, third vein branched at 13/25 distance from anterior to discal crossvein, the anterior branch of the third vein ends in the second vein.

Some specimens have the mesonotal bristles all white and also the occipitals.

Efferia pogonias (Wiedemann).

Asilus pogonias WIEDEMANN, 1821, *Diptera Exotica*. Kiliae., vol. 1, p. 198. Types N.A.

Erax rufibarbis HINE, 1919, *Ann. Entomol. Soc. Amer.*, vol. 12, p. 137. Description and says, "The species has a wide range in Eastern North America, including the West Indies. Normally colored specimens are at hand from as far west as the Dakotas and central Texas. Farther west specimens are lighter in color and indications are that *rufibarbis* more or less gradually approaches *bicaudatus* in that region."

Efferia barbata MARTIN, 1962, *Jour. Kansas Entomol. Soc.*, vol. 35, p. 248. Describes the syntypes of *E. barbata* (Fabricius) and *E. pogonias* Wiedemann which are in poor condition (Denmark), and the type female of *E. rufibarbis* (Macquart) which is in good condition (Paris). Gives synonymy and references.

Specimens are known from the following: Connecticut, Kansas, Minnesota, New Jersey, New York, Ohio, Texas, and Virginia. August to October.

The yellowish mystax, black hairs on the basal 5 abdominal segments both dorsally and ventrally, black or yellowish hairs on the surstyli, black

hairs on the femora and tibiae, and the yellow in the wings along the veins serve to separate this from the other species.

In the west, Texas to Arizona and north to Alberta and Manitoba, the related species is *E. helenae* (Bromley).

***Efferia utahensis* (Bromley).**

Erax utahensis BROMLEY, 1937, Utah Acad. Sci., Arts and Letters, vol. 14, p. 103. Type male, Price, Utah, August 26, 1935 (C. J. Sorenson) USU or USNM.

Specimens are known from the following locality, *Utah*: 1 and 2 mi. S. of Price, State Highway 10, 9 September 1963 (Itol J. and J. Wilcox).

FEMALE. Length 25 mm. Head black, yellowish gray pollinose. Hairs white, palpi largely and a few short hairs on ocellar tubercle black; bristles yellowish white, 4-5 laterally on each side of mystax and 5 on ocellar tubercle black; face at antennae 45/51 width of one eye, vertex 35. Antennae black, hairs white, segments measure 19-9-21-32.

Mesonotum black, brown pollinose, divided central stripe and intermediate spots appearing black, humeri and lateral margins behind suture grayish. Hairs on humeri, anterior and lateral margins, short white; remainder short black, central crest black about as long as antennae 1-2, white posteriorly. Bristles yellowish white, 3-4 presutural, 2 supraalar, 3 postalar (half black). Pleura and coxae grayish brown pollinose, hairs white, bristles yellowish white. Scutellum grayish brown pollinose, about 18 bristles and shorter hairs, yellowish white.

Abdomen black, yellowish gray pollinose; hairs white, longer on sides of 1-3 and venter; ovipositor black, 4.0 mm. long.

Legs black, a touch of brown basally on fore and middle tibiae. Hairs white, dorsally on fore femora and all tarsi black. Bristles black, below on fore femora and partly on middle femora yellowish. Claws black, base reddish; empodia and pulvilli brown.

Halteres brown, stem lighter. Wings hyaline, veins brown, anterior crossvein at 38/72 length of discal cell, third vein branched at 29/34 distance from anterior to discal crossvein.

MALE. Length 23 mm. Six black bristles on ocellar tubercle. Abdominal segments 1-5 grayish brown pollinose but appearing black at most angles; 6-7 densely white; hairs white, long on 1-3, short on 4-5, very short on 6-7. Venter pollinose like dorsum, hairs erect white on 1-5, short on 6-7. Eight whitish pollinose, dense dorsally, hairs white. Surstyli black, ventral margin and apex brown, hairs white with a few black on dorsum; lower forceps black, brownish apically, hairs white, fringe black with a dense margin of white hairs, subequal in length to antennae 1-2 becoming shorter apically.

STAMINEA GROUP (Stramineus Group)

Hine (1919) says, "One of the largest groups of the genus *Erax* is characterized by having the furcation of the third vein distinctly anterior to the base of the second posterior cell. In most all the species the mesothorax has many bristles posteriorly and the scutellum has many bristles on its margin and often numerous long hairs on its disc. Practically all the species are western or southern in distribution."

The Staminea Group is the largest group insofar as the Nearctic species are concerned and probably needs dividing. Martin (1965) has suggested an Inflata Group and a Wilcoxi Group which are not used here as only three species are involved in this region. The species related to *E. argentifrons* (Hine) with male sternite 8 produced or the species related to *E. coquilletti* (Hine) with long white hair on abdominal segments 2-7, would make larger groups but are not used as they are based on one sex only.

Most difficulty in determining species in this group will be with female specimens. Measurements of the width of the face, eyes, vertex, antennae, position of the anterior crossvein in relation to the length of the discal cell from base to apex, furcation of the third vein, length of ovipositor and its width at the middle in relation to its length, are given in the descriptions. Actual measurements should be made as some of these are deceptive, for example, the middle of the ovipositor is much farther back than it appears to be from general observation.

Hine (1919) divided the group into two subgroups based on the furcation of the third vein, *i.e.*, furcation of the third vein at or before the middle of the distance between the base of the second posterior cell (discal crossvein or apex of discal cell) and the small crossvein (anterior crossvein), and furcation distinctly beyond the middle. This is a useful character but is subject to considerable variation and should be used with caution. Measurements were made of five female specimens of each species for this character and also for the length of the ovipositor. These measurements are given below, when less than five specimens were available the number is given in parentheses following the names of the species.

FEMALES OF THE STAMINEA GROUP

Species	Third vein branched before the middle of the distance between the anterior and discal crossveins	Length of ovipositor in mm.	
		Range	Average
<i>E. argentifrons</i>	11/36	3.9-4.7	4.3
<i>E. argyrosoma</i>	11/33	4.6-5.6	5.1
<i>E. bexarensis</i> (4)	14/31	3.3-3.8	3.6
<i>E. canella</i>	11/26	4.7-5.6	5.2
<i>E. pallidula</i>	14/34	4.1-4.6	4.4

Species		Length of ovipositor in mm.	
		Range	Average
<i>E. rapax</i>	13/36	4.2-4.6	4.3
<i>E. staminea</i>	10/27	3.8-4.7	4.2
<i>E. texana</i>	13/35	5.3-6.6	5.8
<i>E. truncata</i>	15/36	6.0-7.0	6.5
<i>E. varipes</i>	14/41	4.0-4.7	4.3
Third vein branched at middle of distance between the anterior and discal crossvein or measurements inconsistent.			
<i>E. basini</i>	12/25	3.7-4.2	4.0
<i>E. benedicti</i>	13/28	3.8-5.0	4.7
<i>E. californica</i>	14/30	4.7-5.6	5.2
<i>E. cana</i>	17/27	3.5-4.4	4.0
<i>E. knowltoni</i> (o)	at middle	equals abdominal segments 4-7	
<i>E. mesquite</i> (o)	at middle	equals abdominal segments 3-7	
<i>E. pilosa</i>	12/21	2.2-2.7	2.5
<i>E. prairiensis</i>	17/30	3.7-4.1	3.9
Third vein branched beyond the middle of the distance between the anterior and discal crossveins			
<i>E. auripila</i> (4)	24/31	3.1-4.1	3.7
<i>E. clementi</i> (2)	16/26	3.8-4.0	3.9
<i>E. coquilletti</i>	14/20	3.5-4.1	3.8
<i>E. deserti</i>	14/22	3.2-3.8	3.6
<i>E. ehrenbergi</i>	15/21	4.0-4.7	4.4
<i>E. inflata</i>	17/29	4.4-5.8	5.1
<i>E. interrupta</i>	19/32	3.2-3.8	3.5
<i>E. monki</i> (o)	beyond middle	no data	
<i>E. nemoralis</i>	25/33	4.6-6.5	5.9
<i>E. neoinflata</i>	19/32	4.7-5.6	5.2
<i>E. parkeri</i>	16/21	2.8-3.0	2.9
<i>E. plena</i> (3)	23/37	5.6-6.2	5.9
<i>E. wilcoxi</i> (3)	16/17	2.1-2.3	2.2
<i>E. yermo</i> (3)	17/21	4.9-5.5	5.2
<i>E. yuma</i>	13/17	2.7-3.8	3.1

KEY TO THE SPECIES OF THE STAMINEA GROUP—MALES

1. Posterior side of the femora red 2
 Femora black, sometimes reddish at base and apex 4
2. Upper forceps (surstyli) deeply notched at apex; abdomen brownish black, posterior corners of 2-4, posterior margin of 5, and 6-7 largely, yellowish gray pollinose; length 22-27 mm. (coast to coast in southern half of the United States, south to Guatemala) *E. interrupta* (Macquart) 3
 Upper forceps not notched apically; abdomen grayish pollinose 3
3. Sternite 8 produced and nearly twice as long as sternite 7; surstyli truncate apically with 2 lobes on upper part; abdominal segments 2-4 blackish basally; length 20-24 mm. (Arizona) *E. canella* (Bromley) 4
 Sternite 8 not produced and about 1/2 length of sternite 7; surstyli broadly rounded apically and with 2 small lobes at middle; abdomen yellowish gray pollinose; length 22-28 mm. (Arizona, Kansas, Colorado, New Mexico) *E. varipes* (Williston) 4
4. Mystax with black and white hairs and bristles 5
 Mystax all white or yellowish, at most 1-2 black bristles 7
5. Scutellum with dense clumps of white parted hairs on disc; abdominal segments 1-2 and 8 yellowish gray pollinose, 3-7 silvery pollinose, 2-7 with white parted hair; length 18-19 mm. (California) *E. clementi* (Wilcox and Martin) 6
 Scutellum with sparse erect hairs; abdomen silvery pollinose, segment 1 and base of 2 brown, segments 2-5 with white parted hairs 6
6. Surstyli from dorsal view 2.5-3.0 mm. wide near apex; venter of abdomen largely black haired; length 20-25 mm. (California) *E. inflata* (Hine) 7
 Surstyli from dorsal view 2.0 mm. wide near apex; venter of abdomen white haired, sometimes black on 3-4; length 20-22 mm. (California) *E. neoinflata*, new species 7
7. Mystax yellow or yellowish 8
 Mystax white 14
8. Scutellar bristles black 9
 Scutellar bristles yellowish 10
9. Abdominal segments 1-3 brown pollinose, 4-7 silvery pollinose, 4 with white parted hair; anterior mesonotal hairs subequal in length to antennae 2; length 23-30 mm. (Kansas, Texas, Oklahoma) *E. plena* (Hine) 11
 Abdominal segments 1-3 and 7 brown pollinose, 3-6 silvery pollinose, apex of 3 and 4 with white parted hair; anterior mesonotal hairs subequal in length to antennae 1; length 24-27 mm. (Kansas, Louisiana, Ohio, Oklahoma, Texas, Virginia) *E. nemoralis* (Hine) 11
10. Abdomen with white parted hair on 3 or more segments 11
 No white parted hairs on abdomen 12
11. Abdominal segment 2 apically and 3-7 silvery pollinose with white parted hair becoming very short on 6-7; lower forceps with long tail, fringe brown and long dense; length 15-18 mm. (Colorado, Montana, Wyoming) *E. staminea* (Williston) 12
 Abdominal segment 3 apically and 4-7 silvery pollinose with white parted hair becoming very short on 6-7; lower forceps with short tail, fringe golden and short sparse; length 20-25 mm. (Arizona, Colorado, Mexico, New Mexico) *E. rapax* (Osten Sacken) 12
12. Abdominal segments 2-7 silvery pollinose; terminalia reddish, surstyli in lateral view slender and tapers apically; length 18-25 mm. (Texas, New Mexico, Oklahoma) *E. bexarensis* (Bromley) 13
 Only apical abdominal segments silvery; terminalia brown 13

13. Abdominal segments 3-5 brown basally, 6-7 silvery; scutellar hairs and bristles yellow, hairs dense and as long as bristles; length 16-26 mm. (Texas) .. *E. auripila* (Hine)
 Abdominal segments 2-6 brown basally, 7 silvery; scutellar bristles brown (sometimes yellowish), discal hairs sparse yellowish and about 1/2 length of bristles; length 21-26 mm. (Kansas, Oklahoma, Texas) *E. prairiensis* (Bromley)
14. Sternite 8 shorter than sternite 7, not produced apically 15
 Sternite 8 as long or longer than sternite 7, produced apically 27
15. Abdomen brown pollinose, segments 1 and, sides and posterior margins of 2-6 and anterior margins of 2-3, gray pollinose, no long white hairs on any segments; terminalia yellowish red; scutellar bristles white; length 9-12 mm. (Arizona, New Mexico, Texas) *E. wilcoxi* (Bromley)
 Abdomen with white parted hair on one or more segments 16
16. Segment 2 and 3 of abdomen black basally 17
 Abdomen wholly gray or white pollinose 20
17. Surstyli broad, similar to *E. nemoralis* but more rounded apically, in dorsal view not wider apically than at base; abdominal segments 3 posteriorly and 4-7 silvery pollinose, posterior margin of 3 and 4-6 with white parted hair; length 18-21 mm. (Texas) *E. monki* (Bromley)
 Surstyli in side view narrower than in *E. nemoralis*, in dorsal view broader apically than at base; abdominal segment 3 apically and 4-7 with dense white parted hair 18
18. Surstyli near apex in dorsal view 1 1/2 times as wide as at the base, in lateral view rounded apically with a short narrow flange; face at antennae 30/40 width of one eye, ♂ ♀; length 12-19 mm. (California) *E. coquilletti* (Hine)
 Surstyli near apex in dorsal view 1 1/4 times as wide as at the base, in lateral view slightly narrowed apically with a broad flange 19
19. Hairs anteriorly on mesonotum as long as antennae 1-2, about 8 anterior dorsocentral bristles; ♂ face 25/35, ♀ 25/38 width of one eye; length 12-20 mm. (Arizona) *E. parkeri*, new species
 Hairs anteriorly on mesonotum as long as antennae 1, at most 2-3 anterior dorso-central bristles; ♂ face 25/36, ♀ 28/41 width of one eye; length 13-20 mm. (Arizona) *E. ehrenbergi*, new species
20. Abdominal segments 2-4 with long white parted hair, short parted on 5-7 21
 Abdominal segments 2-7 with white parted hair 22
21. Terminalia reddish to brown, surstyli truncate at apex, lower forceps with sparse fringe of white and black hairs; 6-8 black scutellar bristles, discal hairs short black; length 22-30 mm. (Arizona, Colorado) *E. truncata* (Hine)
 Terminalia black, surstyli rounded apically with an apical flange and tuft of white and black hairs, lower forceps with a dense fringe of white and brown hairs; 20 white scutellar bristles, discal hairs white and as long as the bristles; length 15-25 mm. (Arizona, California, Colorado, Utah) *E. cana* (Hine)
22. Scutellar bristles black; terminalia black, from above narrower than segment 6, sides parallel, not swollen at tip, from side, general outline cylindrical; sternite 7 with a little tuft of black hairs; length 13 mm. (Texas) *E. mesquite* (Bromley)
 Scutellar bristles white 23
23. Terminalia red; discal hairs of scutellum sparse and about 1/2 length of marginal bristles; surstyli with a narrow flange apically, lower forceps with a sparse fringe of white hairs; femora narrowly reddish at base and apex; length 11-16 mm. (New

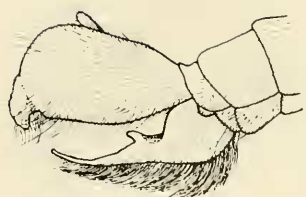
- Mexico, Texas) *E. pilosa* (Hine)
 Terminalia black; discal hairs of scutellum dense and as long as the marginal bristles 24
24. Palpi in part black haired; leg bristles largely black; surstyli truncate apically; length 15-17 mm. (Utah) *E. knowltoni* (Bromley)
 Palpi white haired; leg bristles white 25
25. Surstyli in lateral view wider at apex than at base, apical margin concave, dorsum with black hairs; upper occipitals black; length 16-20 mm. (California)
 *E. yermo*, new species
 Surstyli in lateral view not wider at apex than at base, apical margin convex, terminalia all white haired; occipital bristles usually all white 26
26. Parted hairs on abdomen dense and extending over lateral margins on segments 2-7, venter 1-7 with erect hairs; 4-6 slender black anterior dorsocentral bristles; length 12-19 mm. (Arizona, California) *E. yuma*, new species
 Parted hairs on abdomen dense on 2-4, recumbent and not extending over lateral margins on 5-7, short on venter of 5-7; no anterior dorsocentral bristles; length 17-24 mm. (Arizona, California) *E. deserti*, new species
27. Abdominal hairs sparse, longer and somewhat parted posteriorly on segments 2-3 28
 Long white parted hairs on abdominal segments 2-4 at least 30
28. Abdomen uniformly gray pollinose; discal hairs of scutellum white; surstyli in dorsal view nearly as wide as tergite 7, somewhat broader apically; length 18-26 mm. (California, Nevada, Oregon) *E. californica* (Schaeffer)
 Abdominal segments black basally; discal hairs of scutellum in part black; surstyli in dorsal view much narrower than tergite 7, of nearly uniform width 29
29. Abdominal segments 2-6 black basally, 6 sometimes and 7 silvery; scutellar hairs all black; sternite 8 broad, truncate apically, hairs black or white; length 23-30 mm. (Arizona, Oklahoma, Texas) *E. texana* (Banks)
 Abdominal segments 2-4 black basally, 5-7 gray pollinose; scutellar hairs black and white; sternite 8 narrow apically with black hairs; length 20-24 mm. (Arizona, Mexico) *E. canella* (Bromley)
30. Terminalia largely white haired; abdomen gray pollinose at most; segments 6-7 white pollinose; sternite 8 white haired 31
 Terminalia largely black haired; abdomen white pollinose; sternite 8 black haired 32
31. Surstyli in lateral view narrowed apically, apex divided and the upper lobe larger than the lower lobe; abdominal segments 2-5 brown pollinose basally, 6-7 white pollinose; length 23-25 mm. (Arizona, Kansas, New Mexico, Oklahoma, Texas)
 *E. argyrosoma* (Hine)
 Surstyli in lateral view broadened apically, not divided at apex but with a rounded lobe above on the margin; abdomen gray pollinose, thin sometimes on segment 2; length 15-25 mm. (Arizona, California, Colorado, Idaho, Oregon, Utah, Washington) *E. benedicti* (Bromley)
32. Surstyli divided at apex, lower lobe slightly larger than the upper lobe; scutellar hairs and bristles largely black; mesonotum and abdominal segments 1-2 yellowish pollinose; length 18-23 mm. (Kansas, Oklahoma, Texas) *E. argentifrons* (Hine)
 Surstyli not divided at apex; scutellar hairs white 33
33. Surstyli in lateral view narrowed apically, the large rounded triangular lobe almost covering the apex; scutellar bristles white; anterior mesonotal hairs subequal in length to antennae 2; length 18-28 mm. (Colorado, Kansas, New Mexico)
 *E. pallidula* (Hine)
 Surstyli in lateral view not narrowed apically, apex truncate with a rounded lobe

on the upper half; scutellar bristles black; anterior mesonotal hairs as long as antennae 1-2; length 15-21 mm. (Arizona, Idaho, Nevada, Utah)
 *E. basini*, new species

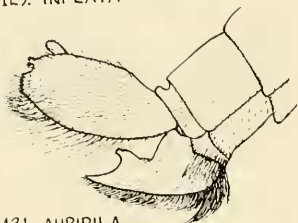
KEY TO THE SPECIES OF THE STAMINEA GROUP—FEMALES

1. Posterior side of the femora red 2
 Femora black, sometimes reddish at tip 4
2. Ovipositor conical, 3.5 mm. long *E. interrupta*
 Ovipositor flattened 3
3. Ovipositor broad for its entire length, 4.5 mm. long *E. varipes*
 Ovipositor much narrower at apex than at base, 5.2 mm. long *E. canella*
4. Mystax with black and white hairs or bristles 5
 Mystax white or yellowish, at most 1-2 black bristles below 7
5. Ovipositor at base of tergite 8 with a rounded tubercle below on each side, 5.1 mm. long *E. inflata*
 Ovipositor usually without definite basal tubercles 6
6. Scutellum with dense white parted hairs on disc; ovipositor without basal swelling, 3.9 mm. long *E. clementi*
 Scutellum with short sparse erect mostly white hairs on disc; ovipositor with basal swelling, 5.2 mm. long *E. neoinflata*
7. Mystax yellow or yellowish 8
 Mystax white 14
8. Ovipositor abruptly narrowed apically or of uniform width, tergite 9 nearly 2 times length of cerci 9
 Ovipositor gradually narrowing apically, tergite 9 and cerci subequal in length 13
9. Scutellar bristles black 10
 Scutellar bristles white or yellowish 11
10. Abdominal segments 2-6 brown basally, 7 all brown, 6-7 black haired dorsally; scutellar hairs black; ovipositor 5.9 mm. long *E. nemoralis*
 Abdomen all yellowish pollinose and yellowish haired; scutellar hairs yellow; ovipositor 5.9 mm. long *E. plena*
11. Scutellar hairs yellowish and nearly as long as the marginal bristles; ovipositor 3.7 mm. long *E. auripila*
 Scutellar hairs much shorter than the marginal bristles 12
12. Scutellar hairs yellow; ovipositor broad and of nearly uniform width, 3.6 mm. long *E. bexarensis*
 Scutellar hairs all or in part black; apical 2/3 of ovipositor narrow, 3.6 mm. long *E. prairiensis*
13. Fore femora below with long fine bristles; scutellar hairs in part black; ovipositor 4.2 mm. long *E. staminea*
 Fore femora below with stout bristles; scutellar hairs all yellowish; ovipositor 4.3 mm. long *E. rapax*
14. Third vein forked beyond the middle of the distance between the anterior and discal crossvein; anterior mesonotal hairs as long as antennal segment 1 15
 Third vein forked at or before the middle of the distance between the anterior and discal crossvein; anterior mesonotal hairs usually not longer than antennal segment 2 24
15. Scutellar and occipital bristles white 16
 Scutellar and occipital bristles at least in part black 21

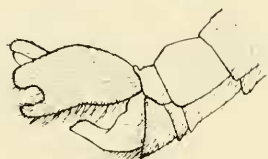
- | | |
|--|------------------------|
| 16. Ten scutellar bristles or less | 17 |
| Twelve or more scutellar bristles | 18 |
| 17. Abdomen grayish pollinose, the dorsum appearing black at some angles; 8-10 scutellar bristles; ovipositor black, forked at tip, 2.5 mm. long | <i>E. pilosa</i> |
| Dorsum of abdominal segments brown pollinose, sides and posterior margins gray; 6-8 scutellar bristles; ovipositor reddish at base, 2.2 mm. long | <i>E. wilcoxi</i> |
| 18. Anterior branch of the third vein ends in the costa; abdominal segment 2 with long more or less parted hairs, 6-7 black haired dorsally; ovipositor 4.0 mm. long | <i>E. cana</i> |
| Anterior branch of the third vein usually ends in the second vein; at least abdominal segments 2-3 with long more or less parted hairs | 19 |
| 19. Abdominal segments 2-3 with long more or less parted hairs, 7 black haired dorsally; ovipositor 5.2 mm. long | <i>E. yermo</i> |
| Abdominal segments 2-4 with long more or less parted hairs, all white haired; ovipositor 3.1 to 3.6 mm. long | 20 |
| 20. Tarsi brown; no anterior dorsocentral bristles; ovipositor 3.6 mm. long | <i>E. deserti</i> |
| Tarsi yellowish red; 4-5 slender anterior dorsocentral bristles, usually black; ovipositor 3.1 mm. long | <i>E. yuma</i> |
| 21. Abdomen wholly gray pollinose; ovipositor as long as abdominal segments 3-7 | <i>E. monki</i> |
| Abdomen black dorsally, gray laterally | 22 |
| 22. Abdominal segments 2-7 with black hairs dorsally; scutellar and occipital bristles in part black; ovipositor 4.4 mm. long | <i>E. ehrenbergi</i> |
| At most abdominal segments 6-7 with black hairs dorsally | 23 |
| 23. Abdomen all white haired; scutellar and occipital bristles in part black; ovipositor 2.9 mm. long | <i>E. parkeri</i> |
| Abdominal segments 6-7 black haired dorsally; scutellar bristles frequently all white, occipitals in part black; ovipositor 3.8 mm. long | <i>E. coquilletti</i> |
| 24. Third vein branched at the middle of the distance between the anterior and discal crossvein | 25 |
| Third vein branched before the middle of the distance between the anterior and discal crossvein | 26 |
| 25. Scutellar bristles black; ovipositor about as long as abdominal segments 3-7 | <i>E. mesquite</i> |
| Scutellar bristles white; ovipositor equal in length to abdominal segments 4-7 | <i>E. knowltoni</i> |
| 26. Ovipositor 5.8 mm. long or longer | 27 |
| Ovipositor at most 5.2 mm. long | 28 |
| 27. Abdominal segments 2-5 gray pollinose, 6-7 brownish; ovipositor with a wedge shaped projection at the base of sternite 8, 6.5 mm. long | <i>E. truncata</i> |
| Abdominal segments 2-6 basally and 7 largely black; ovipositor without basal projection, 5.8 mm. long | <i>E. texana</i> |
| 28. Scutellar bristles black | 29 |
| Scutellar bristles white | 32 |
| 29. Palpi white haired | 30 |
| Palpi at least in part black haired | 31 |
| 30. Abdominal segments 6-7 black haired dorsally; ovipositor 5.1 mm. long | <i>E. argyrosoma</i> |
| Abdomen white haired; ovipositor 4.3 mm. long | <i>E. argentifrons</i> |
| 31. Abdomen gray pollinose, dorsum of 2-6 and all of 7 brown, a few black hairs dorsally on 1-4 and many on 5-7; ovipositor 5.2 mm. long | <i>E. californica</i> |



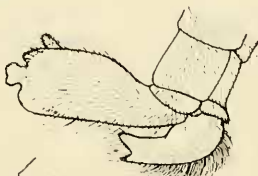
129. INFLATA



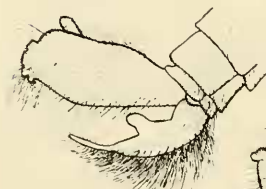
131. AURIPILA



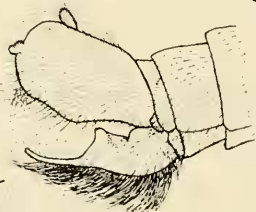
134. INTERRUPTA



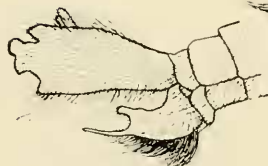
136. RAPAX



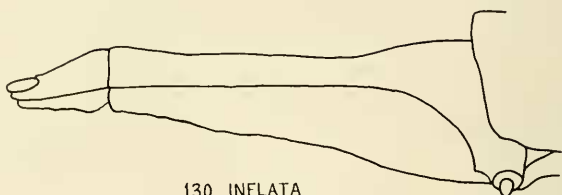
138. CANA



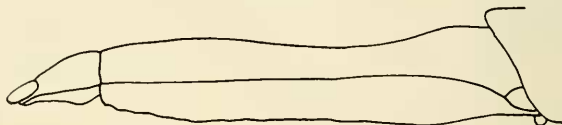
140. NEOINFLATA



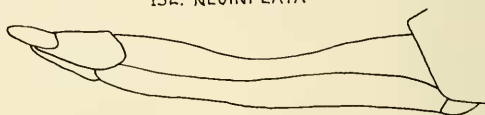
142. STAMINEA



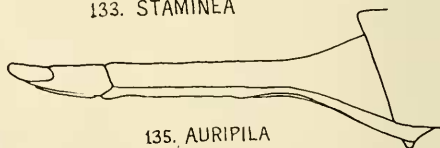
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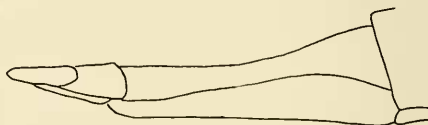
132. NEOINFLATA



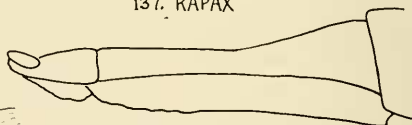
133. STAMINEA



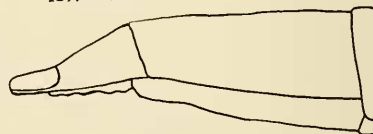
135. AURIPILA



137. RAPAX



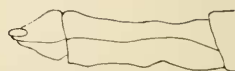
139. CANA



141. INTERRUPTA



143. WILCOXI



144. WILCOXI

- Abdomen gray pollinose the dorsum appearing black, dorsum of 5-6 with a few and 7 with many black hairs; ovipositor 5.2 mm. long *E. canella*
32. Anterior mesonotal hairs as long as antennae 1; scutellar hairs nearly as long as the bristles, sometimes 1-3 of the bristles black; ovipositor 4.0 mm. long *E. basini*
- Anterior mesonotal hairs shorter than antennae 2; scutellar hairs 1/2 length of the bristles 33
33. Abdomen white haired; bristles of head and mesonotum all or largely white; ovipositor of nearly uniform width, 4.7 mm. long *E. benedicti*
- Abdominal segment 7 black haired dorsally; occipital and mesonotal bristles partly to largely black; ovipositor tapering from base to apex, 4.4 mm. long *E. pallidula*

Efferia argentifrons (Hine).

Erax argentifrons HINE, 1911, Ohio Nat., vol. 11, p. 308.

Types male and female, Clark County, Kansas (F. H. Snow), OSU.

Erax argentifrons HINE, 1919, Ann. Entomol. Soc. Amer., vol. 12, p. 148.

Description and figure of male hypopygium.

Bromley (1934) reports from the following localities in *Texas*: Austin, May (U.T.); Austin and Bastrop, March 3, May 30 (R. H. Painter); Bastrop, May 29, 1921, in pine region; Bexar County, May 1, 1929 (H. B. Parks); Marathon, July 1-2, 1916 (Lutz-AMNH).

Specimens are known from the following localities. *Kansas*: Gove County, 2,813 feet (F. X. Williams); Jewell County, 8 July 1915 (R. H. Beamer); Osborne County, 1,557 feet, 7 August 1912 (F. X. Williams); Rawlins County, 4 July 1925 (R. H. Beamer); Russell County, 1,830 feet, 20 July 1912 (F. X. Williams); Saline County, 14 July 1923 (R. H. Beamer, C. H. Martin); Scott

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FIGURES 129-144. Staminea Group, lateral view of the male terminalia and ovipositor of the *Efferia* species.

129. *E. inflata* (Hine), male terminalia.
130. *E. inflata* (Hine), ovipositor.
131. *E. auripila* (Hine), male terminalia.
132. *E. neoinflata*, new species, ovipositor.
133. *E. staminea* (Williston), ovipositor.
134. *E. interrupta* (Macquart), male terminalia.
135. *E. auripila* (Hine), ovipositor.
136. *E. rapax* (Osten Sacken), male terminalia.
137. *E. rapax* (Osten Sacken), ovipositor.
138. *E. cana* (Hine), male terminalia.
139. *E. cana* (Hine), ovipositor.
140. *E. neoinflata*, new species, male terminalia.
141. *E. interrupta* (Macquart), ovipositor.
142. *E. staminea* (Williston), male terminalia.
143. *E. wilcoxi* (Bromley), male terminalia.
144. *E. wilcoxi* (Bromley), ovipositor.

County, 17-19 June 1925 (R. H. Beamer, Howard Deay). *Oklahoma*: Kenton, 21-27 June 1933 (A. E. Pritchard). *Texas*: Austin, 20 April, 5 May 1932, 16 May 1930; Bexar County, 1 May 1929 (H. B. Parks); Goldthwaite, 29 May 1933; Italy, 30 May 1935.

MALE. Length 22 mm. Head black, grayish white pollinose. Hairs and bristles white; 2 bristles and 3-4 hairs on ocellar tubercle and upper occipitals black. Face at antennae 43/49 width of one eye, vertex 37. Antennae black, hairs white, segments measure 16-9-20-30.

Mesonotum black, brownish pollinose, humeri and posterior lateral margins grayish. Hairs black, anteriorly subequal in length to antennae 2, a few on humeri and laterally white. Bristles black, no anterior dorsocentral. Scutellum brown pollinose, hairs black and as long as antennae 1-2, a few shorter white basally; 8 black marginal bristles.

Abdomen black, segments 1-2 grayish pollinose, 3-7 white. Hairs white, long parted posteriorly on 2 and all of 3, short on 4-7, parted on 4. Venter grayish white pollinose, hairs long white basally gradually shorter to 5, 6-7 very short. Eight brown, in part thinly grayish pollinose, short hairs white, sternite produced and nearly 2 times length of sternite 7. Terminalia reddish brown; surstyli white haired with 4-5 black on ventral margin; fringe black margined with white, subequal in length to antennae 2 and becoming shorter apically.

Wings hyaline, veins reddish brown, anterior crossvein at 35/67 length of discal cell, third vein branched at 17/32 distance from anterior to discal crossvein, stump vein a little longer than anterior crossvein.

FEMALE. Length 23 mm. Scutellar hairs white, subequal in length to antennae 1. Abdomen grayish white pollinose; hairs short white, longer on sides of 1-2, 1 with 4-5 yellowish lateral bristles. Venter gray pollinose and white haired as in male. Ovipositor 4.5 mm. long, at middle 1/7 as wide as long. Anterior crossvein at 35/70 length of discal cell, third vein branched at 14/35 distance from anterior to discal crossvein.

Efferia argyrosoma (Hine).

Erax argyrosoma HINE, 1911, Ohio Nat., vol. 11, p. 310. Type male and female, near Albuquerque, New Mexico (J. R. Watson), OSU.

Erax argyrosoma HINE, 1919, Ann. Entomol. Soc. Amer., vol. 12, p. 144. Description and figure of the male hypopygium; reports from other localities in New Mexico and western Texas.

Bromley (1934) reports from the following localities in *Texas*: Austin, March 12, May 1932 (U.T.); Chisos Mountains, July 8, 1930 (H. M. Smith); Davis Mountains, Fort Davis Quadrangle, Phantom Lake, June 1, 1916 (F. M. Gaige); El Paso, July 1 (Duncan); Erwin, August 4, 1931 (R. H. Painter); Junction, August 15; Orla, August 5, 1931; Trans-Pecos, 1916 (F. M. Gaige).

Specimens are known from the following localities. *Arizona*: Portal, 24, 29 July 1963 (M. A. Cazier, J. Wilcox), 2 mi. E., 14 August 1962 (J. Wilcox), 2 mi. S., 30 May 1962 (J. Wilcox), 2 mi. N.E., 13, 15 August 1962 (Itol J. and J. Wilcox), 4 mi. W., 13, 14 August 1962 (Itol J. and J. Wilcox). *Kansas*: Scott County, 17 June 1925 (R. H. Beamer). *New Mexico*: Alamogordo, 7 May 1902; 11 mi. S. of Animas, 27 July 1963 (M. A. Cazier, M. Mortenson, J. Wilcox); Hidalgo County, 3 June 1937 (R. T. Kellogg); Malaga, 11 July 1936 (J. D. Beamer, D. R. Lindsay); Rodeo, 20 July 1962 (W. J. Gertsch), 1 mi. N., 24, 26 July 1963 (J. Wilcox); Tucumcari, 4 June 1933, 25 June 1932 (R. H. Beamer).

MALE. Length 20 mm. Head black, whitish pollinose. Hairs and bristles white; 2 on ocellar tubercle, upper occipitals and 1-2 hairs on palpi, black. Face at antennae 40/45 width of one eye, vertex 33. Antennae black, grayish pollinose, hairs white, segments measure 15-9-17-29.

Mesonotum black, humeri reddish; gray pollinose, central stripe and intermediate spots brown. Hairs black, anteriorly 1/2 length of antennae 2; humeri in part and all margins with white hairs; 1 weak black anterior dorso-central. Scutellum black, gray pollinose, hairs sparse white and as long as antennae 1-2, 8 black marginal bristles.

Abdomen black, grayish white pollinose, 6-7 white; hairs white, longer erect on sides of 1-3 but not parted. Venter grayish white pollinose; hairs white, long on 1-4, short on 5, very short on 6-7. Eight black, grayish pollinose, hairs white, sternite produced and 1 1/2 times length of 7. Terminalia black, hairs white, above and on ventral margin of surstyli black; fringe brown, some white hairs basally, 2/3 length of antennae 1, short near apex.

Wings hyaline, veins brown, anterior crossvein at 41/70 length of discal cell, third vein branched at 15/30 distance from anterior to discal crossvein, stump vein as long as anterior crossvein.

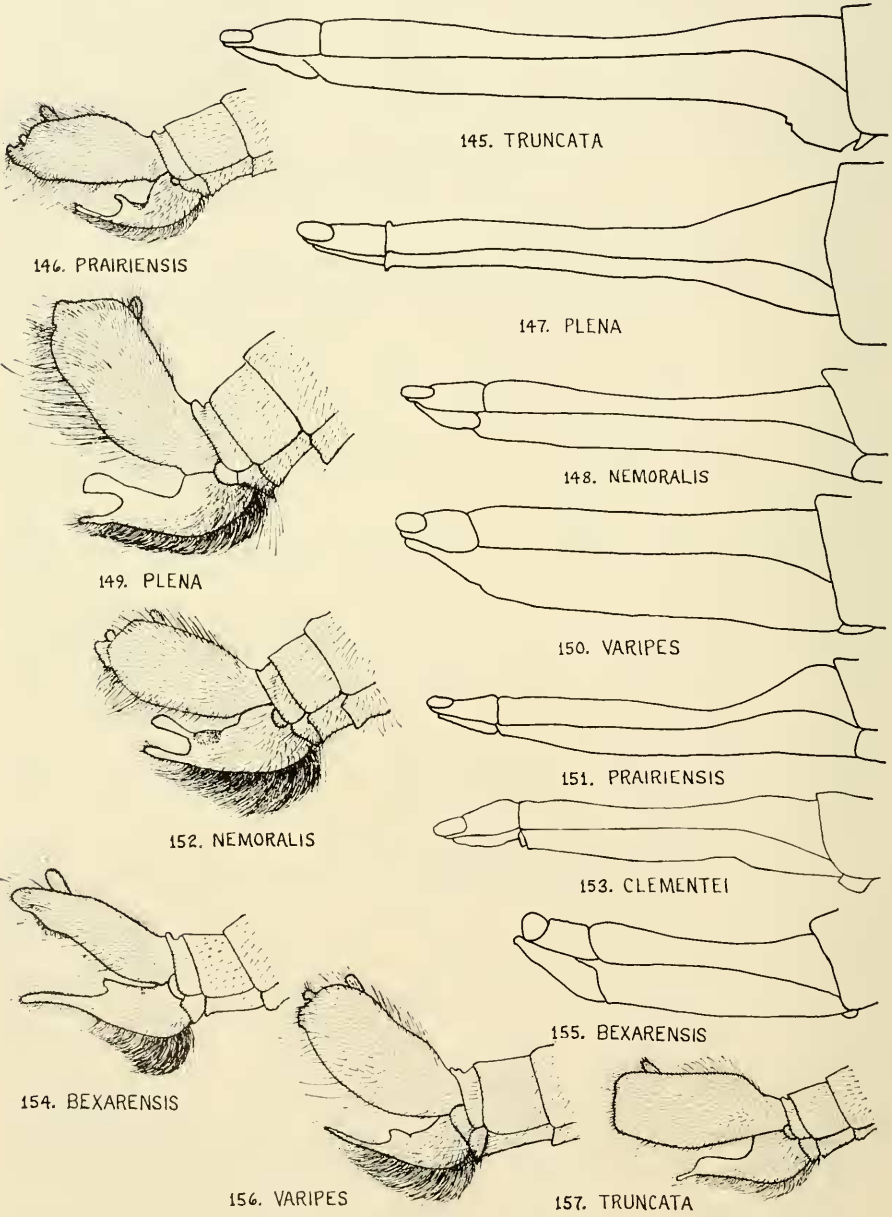
FEMALE. Length 24 mm. Abdomen grayish pollinose, dorsum basally of 2-5 and 6-7 largely brownish pollinose; hairs short white, longer on sides of 1-2. Venter gray pollinose; hairs white, long on 1-5, short on 6, mostly short black on 7. Ovipositor black, 5.3 mm. long, at middle 1/9 as wide as long. Anterior crossvein at 45/83 length of discal cell, third vein branched at 9/38 distance from anterior to discal crossvein.

Efferia auripila (Hine).

Erax auripilus HINE, 1916, Ohio Jour. Sci., vol. 17, p. 22. Type male, Clifton, Texas, May 29, 1907 (E. B. Williamson), OSU. Paratype male, Round Mountain, Texas, ANSP.

Erax auripilus HINE, 1919, Ann. Entomol. Soc. Amer., vol. 12, p. 145. Description of male and figure of the male hypopygium; reports females from different localities in Texas. USNM.

Bromley (1934) reports from the following localities in *Texas*: Austin, April, May (U.T.); Bexar County, June 25, 1928 (H. B. Parks); Dallas.



AMNH; Pampa, June 13, 1930; Round Mountain, AESP; Taylor, May 23, 1929 (J. C. Gaines).

Specimens from the following localities in Texas: Ballinger, 12 June 1932 (S. E. Jones); Bexar County, 1 May 1929, 15 June 1928 (H. B. Parks); Corsicana, 16 May 1933.

MALE. Length 21 mm. Head black, hairs and bristles yellowish, beard and hairs on proboscis whitish, a few black hairs on frons and upper occiput. Face at antennae 49/49 width of one eye, vertex 45. Antennae black, hairs yellowish, segments measure 16-9-17-35.

Mesonotum black, yellowish pollinose, central stripe and intermediate spots brownish. Hairs black, anteriorly subequal in length to antennae 1, on margins and humeri mostly yellowish. Bristles partly yellowish, no anterior dorsocentral. Scutellum yellowish gray, hairs erect yellowish with about 8 black intermixed and as long as antennae 1-3, about 14 slender yellowish marginal bristles.

Abdomen yellowish gray pollinose, 6-7 yellowish white, dorsum 2-5 brown. Hairs yellowish, longer on sides of 1-4, no parted hairs, a few black on dorsum of 5. Venter yellowish pollinose, hairs yellowish, long erect on 1-4. Eight yellowish gray, hairs yellowish, a few short black on tergite, long posteriorly on sternite. Terminalia brown, hairs yellowish, a few black above basally on surstyli; fringe brown margined with yellow, basally as long as antennae 1-2 becoming shorter apically.

Wings hyaline, veins reddish brown, anterior crossvein at 31/60 length of discal cell, third vein branched at 21/29 distance from anterior to discal crossvein, stump as long as anterior crossvein.

FEMALE. Length 22 mm. Anterior mesonotal hairs subequal in length to antennae 2. Scutellar hairs all yellowish, subequal in length to antennae

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FIGURES 145-157. Staminea Group, lateral view of the male terminalia and ovipositor of the *Efferia* species.

145. *E. truncata* (Hine), ovipositor.
146. *E. prairiensis* (Bromley), male terminalia.
147. *E. plena* (Hine), ovipositor.
148. *E. nemoralis* (Hine), ovipositor.
149. *E. plena* (Hine), male terminalia.
150. *E. varipes* (Williston), ovipositor.
151. *E. prairiensis* (Bromley), ovipositor.
152. *E. nemoralis* (Hine), male terminalia.
153. *E. clementi* (Wilcox and Martin), ovipositor.
154. *E. bexarensis* (Bromley), male terminalia.
155. *E. bexarensis* (Bromley), ovipositor.
156. *E. varipes* (Williston), male terminalia.
157. *E. truncata* (Hine), male terminalia.

1-2. Abdomen yellowish pollinose, dorsum 2-7 brownish; hairs yellowish, longer on sides of 1-2. Venter yellowish pollinose, hairs long on all segments but longer on 1-2. Ovipositor black, 3.5 mm. long, basal $1/4$ triangular, at middle $1/8$ as wide as long. Anterior crossvein at $33/73$ length of discal cell, third vein branched at $30/40$ distance from anterior to discal crossvein.

Efferia basini Wilcox, new species.

MALE. Length 19 mm. Head black, white pollinose, frons thinly brownish. Hairs white; on frons black with a few white to sides of antennae; 3 bristles and about 10 hairs on ocellar tubercle, occipital bristles and a few hairs above on palpi, black. Face at antennae $40/44$ width of one eye, vertex 33. Antennae black, hairs white, segments measure 15-8-18-28.

Mesonotum black; grayish brown pollinose, central stripe and intermediate spots brown. Hairs black, anteriorly as long as antennae 1-2 and at suture as long as 1-3; white on margins and a few on humeri. Bristles black, 2 presutural, 2 supraalar, 2-3 postalar, 3 slender posterior dorsocentral. Pleura and coxae grayish pollinose, pleura with golden tinge, hairs white. Scutellum grayish pollinose, hairs white and longer than antennae 1-2, 12 black marginal bristles.

Abdomen black, grayish white pollinose, brownish on dorsum of 2. Hairs white, long parted on 2-4, shorter parted on 5-7. Venter grayish white pollinose, hairs erect white on 1-5, shorter on 6-7. Eight brown, hairs white, a few short black on tergite; sternite produced and $1\frac{1}{5}$ times length of 7 with long hairs apically. Terminalia black, ventral margin of surstyli and apical half of lower forceps brown; hairs white, dorsum and ventral margin of surstyli with black hairs; fringe brown, margined with white, basally $2/3$ length of antennae 1, shorter apically.

Legs black, basal $2/3$ of tibiae reddish, tarsi brown. Hairs white, a few at apex of femora, above on middle tarsi and hind tarsi largely black. Bristles black; claws black, base reddish; pulvilli and empodia brownish.

Halteres brownish. Wings hyaline, veins brown, anterior crossvein at $35/70$ length of discal cell, third vein branched at $12/25$ distance from anterior to discal crossvein, stump $1/2$ length of anterior crossvein.

FEMALE. Length 16 mm. Hairs on frons mostly white, 1 black occipital bristle, palpi all white haired. Anterior mesonotal hairs with many white anteriorly and as long as antennae 1, at suture as long as antennae 1-2. Scutellar hairs as long as antennae 1-2, 10 white marginal bristles. Abdomen grayish white pollinose, 7 brownish dorsally; hairs white, longer on 1-2, a few black dorsally on 6 and many on 7. Venter grayish pollinose, hairs erect white, longer on 1-3. Ovipositor black, 3.7 mm. long, at middle $1/6$ as wide as long. Anterior crossvein at $28/49$ length of discal cell, third vein branched at $11/21$ distance from anterior to discal crossvein.

HOLOTYPE. Male, 28.5 mi. W. of Eureka, Eureka County, Nevada, 6 June 1960 (R. W. Thorp), CIS.

ALLOTYPE. Female, same data.

PARATYPES. *Nevada*: 2 ♂♂, 1 ♀, same data (J. W. MacSwain, R. W. Thorp), CIS; 2 ♂♂, 2 ♀♀, Angel Lake Road, Wells, 17 June 1952 (E. I. Schlinger), UCD; 1 ♂, 2 ♀♀, Charcoal Ovens State Park, White Pine County, 29, 30 June 1960 (T. R. Haig), UCD; 1 ♂, Emigrant Pass, Eureka County, 19 June 1952 (E. I. Schlinger), UCD; 1 ♂, Galconda, Humboldt County, 31 May 1959 (T. R. Haig), UCD; 2 ♀♀, Osage, 25 June 1935 (Jean Russell), JW; 1 ♂, Valmy, Humboldt County, 25 May 1957 (T. R. Haig), UCD. *Arizona*: 1 ♂, Grand Canyon, June (D. K. Duncan), CAS, 1 ♂, 3 June 1945 (K. Cooper), UCD; 2 ♀♀, 12 June 1937 (W. Benedict) (from the paratypes *E. benedicti* Bromley), JW; 1 ♂, 10 mi. W. of Jacob Lake, 6 June 1946 (R. M. Bohart), UCD; 3 ♀♀, 19 mi. S. of Page, 30 May, 3 June 1963 (Itol J. and J. Wilcox), JW. *Idaho*: 1 ♂, Basin, Cassia County, 14 June 1933 (H. E. Cott), UCD. *Utah*: 2 ♂♂, Copper Mountains, Tecoma Range, June 1928 (Vasco M. Tanner) 1709, JW; 1 ♂, Logan, 18 June 1947 (R. M. Bohart), UCD.

Efferia benedicti (Bromley).

Erax benedicti BROMLEY, 1940, Bull. Brooklyn Entomol. Soc., vol. 35, p. 15.

Type male, Winslow, Arizona, June 13, 1937 (W. Benedict), female, Santa Rita Mountains, Arizona, May 9, 1937 (W. Benedict), UK. Paratypes, same data as above and following localities in *Arizona*: Baboquivari Mountains, April 19, 1937; Doney, June 13, 1937; Mustang Mountain, May 18, 1937; Tucson, April 24, 1937; Douglas, May 18, 1937; all (W. Benedict). Two female paratypes, Grand Canyon, Arizona, are placed in *E. basini*, new species.

After much deliberation we have concluded that this common early species in southern Arizona is not different from those which occur farther north later in the season although those that occur later are usually larger and have more black bristles. The range is then from Arizona to Washington, from the western slopes of the Rocky Mountains to the eastern slopes of the Sierra and the Cascade Mountains, and southern California extending as far north as Fresno County in the San Joaquin Valley.

Specimens from the following localities: *Arizona*: widespread except east of Chiricahua Mountains, April to September, common in southern counties April and May. *California*: southern counties north to Fresno County, east slope of Sierras, April to September. *Colorado*: Moffat County, July. *Idaho*: Mountain Home, July. *Nevada*: numerous localities, May to September. *Oregon*: eastern, July and August. *Utah*: numerous localities, May to September. *Washington*: eastern, July and August.

MALE. Length 20 mm. Head black; whitish pollinose, the frons golden. Hairs and bristles white; a few on frons, 2 bristles and 3-4 hairs on ocellar tubercle, 4 upper occipitals on each side and a few hairs, black. Face at antennae 38/46 width of one eye, vertex 30. Antennae black, hairs white, segments measure 15-8-15-30.

Mesonotum black, grayish brown pollinose, central stripe and intermediate spots brown. Hairs black, anteriorly subequal in length to antennae 2, humeri in part and margins with white hairs. Bristles black, no anterior dorsocentral. Scutellum gray pollinose, hairs white with a few black and subequal in length to antennae 1, 7 black and 2 whitish marginal bristles.

Abdomen grayish pollinose becoming white apically. Hairs white, parted on 2-4 but not dense. Venter gray pollinose, hairs white, long on 1-4, shorter on 5, very short on 6-7. Eight black, brownish pollinose, hairs white, sternite 1.6 times length of sternite 7 with long hairs apically. Terminalia brown, hairs white, black on dorsum of surstyli; fringe sparse brown and subequal in length to antennae 2.

Wings hyaline, veins brown, anterior crossvein at 40/61 length of discal cell, third vein branched at 12/24 distance from anterior to discal crossvein, stump vein subequal in length to anterior crossvein.

FEMALE. Length 20 mm. One bristle on ocellar tubercle black, all other hairs and bristles on head white. Anterior mesonotal hairs shorter than antennae 2; bristles mostly white. Scutellar hairs white and subequal in length to antennae 1; 6 white marginal bristles. Abdomen grayish pollinose, 7 brownish; hairs short white, longer on sides of 1-2. Venter gray pollinose, hairs white, long on 1-4. Ovipositor black, 5.0 mm. long, at middle 1/8 as wide as long. Anterior crossvein at 30/57 length of discal cell, third vein branched at 15/27 distance from anterior to discal crossvein.

Hine, 1919, apparently included some of these in *E. californica* as his range is from Washington and Montana to California and Nevada.

***Efferia bexarensis* (Bromley).**

Erax bexarensis BROMLEY, 1934, Ann. Entomol. Soc. Amer., vol. 27, p. 94. Type male, Bexar County, Texas, July 5, 1932 (H. B. Parks), female, same data, July 4, 1932, TAMU. Paratypes, same data, June 14 to July 5; Carrizo Springs, Texas, June 10, 1928 (W. A. Frazier); Laredo, June 18, 1922; Metz, June 16 (R. H. Painter).

Specimens are known from the following localities. *New Mexico*: Portales, 16 July 1936 (M. B. Jackson). *Oklahoma*: Snyder, 10 July 1934 (A. E. Pritchard). *Texas*: San Antonio, 13 June 1933 (G. P. Engelhardt).

MALE. Length 21 mm. Head reddish, white pollinose, frons yellowish. Hairs and bristles yellowish, beard and hairs on proboscis white. Face at antennae 47/49 width of one eye, vertex 35. Antennae black, hairs yellowish, segments measure 14-8-17-33.

Mesonotum black, humeri reddish; yellowish pollinose, broadly divided central stripe and intermediate spots brown. Hairs black, anteriorly $1/2$ length of antennae 2, a few whitish on posterior margin. Bristles yellowish, no anterior dorsocentral. Scutellum grayish yellow pollinose, hairs sparse yellowish and 4 black, in length subequal to antennae 2; 11 yellowish marginal bristles.

Abdomen densely white pollinose, hairs short white. Venter grayish white pollinose, hairs white, long on 1-2. Eight reddish brown, hairs white, a few short black on tergite. Terminalia reddish, surstyli brownish dorsally; hairs yellowish, black dorsally on surstyli; fringe brown, dense basally and as long as antennae 1-2, sparse apically and shorter than antennae 2.

Wings hyaline, veins light brown, anterior crossvein at $36/65$ length of discal cell, third vein branched at $13/29$ distance from anterior to discal crossvein, stump shorter than anterior crossvein.

FEMALE. Length 13 mm. Discal hairs of scutellum shorter than antennae 2, 7 marginal bristles. Abdomen white pollinose, 7 brownish; hairs short white, longer on 1, short black dorsally on 7. Venter grayish white pollinose, hairs short white, a few longer on 1-2. Ovipositor black, 3.1 mm. long, at middle $1/4$ as wide as long.

Efferia californica (Schaeffer).

Erax californicus SCHAEFFER, 1916, Jour. New York Entomol. Soc., vol. 24, p. 67. Type male, Shasta County, California (George Franck), USNM.

Erax californicus, HINE, 1919, Ann. Entomol. Soc. Amer., vol. 12, p. 150. Description and figure of wing; ranging from Washington and Montana to California and Nevada.

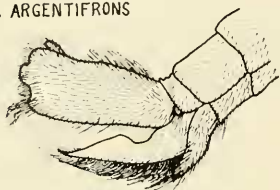
Specimens are known from the following localities. *California*: Alpine, Calaveras, Colusa, Del Norte, El Dorado, Fresno, Lassen, Madera, Mariposa, Merced, Mono, Napa, Plumas, Shasta, Tehama, Trinity, Tulare, and Tuolumne counties, June to August. *Nevada*: 6 mi. W. of Reno, 29 June 1955 (J. C. Downey); 13 mi. N. of Topaz Lake, 1 July 1963 (J. Wilcox); Walley Hot Spring, 24 June 1953 (R. M. Bohart). *Oregon*: Grave Creek, Jackson County, 29 June 1925 (H. A. Scullen); Kerby, 19 July 1935 (Jean Russell).

MALE. Length 21 mm. Head black, face golden, frons golden brown, occiput gray pollinose. Mystax yellowish white; hairs on frons black with a number of white to sides of antennae; 2 bristles and hairs on ocellar tubercle black; occipital bristles black; beard, hairs on proboscis and palpi white, 4-5 black hairs apically on palpi. Face at antennae $40/48$ width of one eye, vertex 33. Antennae black, hairs yellowish white, segments measure 15-8-20-28.

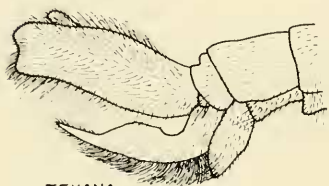
Mesonotum black, brownish pollinose, divided central stripe and intermediate spots indistinctly darker brown. Hairs black, anteriorly subequal in length to antennae 2 and at suture subequal to antennae 1; in part on



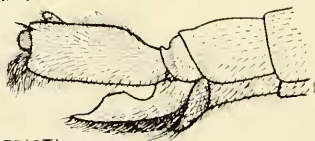
158. ARGENTIFRONS



160. CALIFORNICA



162. TEXANA



165. BENEDICTI



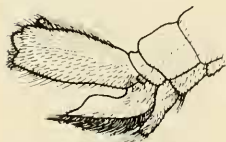
167. ARGYROSOMA



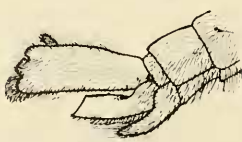
169. PALLIDULA



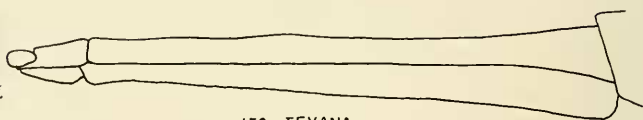
170. BASINI



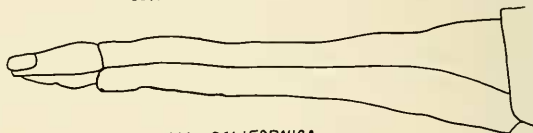
173. BENEDICTI



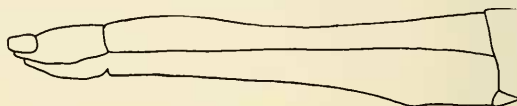
174. CANELLA



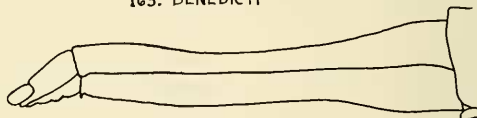
159. TEXANA



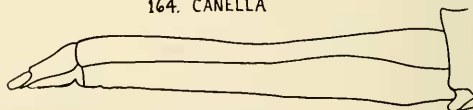
161. CALIFORNICA



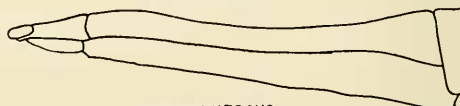
163. BENEDICTI



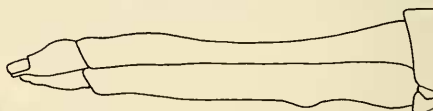
164. CANELLA



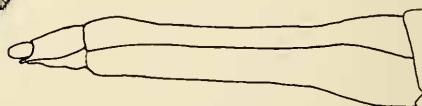
166. ARGYROSOMA



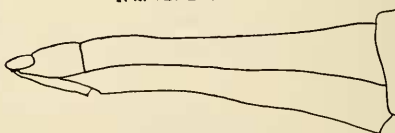
168. ARGENTIFRONS



171. BASINI



172. BENEDICTI



175. PALLIDULA

humeri and all margins white. Bristles black, no anterior dorsocentral. Scutellum grayish brown pollinose, hairs white and as long as antennae 1-2, 6 black and 1 yellowish marginal bristles and some longer white hairs.

Abdomen black, grayish white pollinose, dorsum of 2 broadly and 3-4 narrowly brown. Hairs white, apical $1/2$ of 2 and 3 with long and 4 with shorter sparse parted; long white on sides of 1, dorsum with short white and black, 5 white lateral bristles. Venter gray pollinose, hairs white, long erect on 1-4, shorter erect on 5, short on 6-7 with some longer apically on 7. Eight black, thinly brownish pollinose, tergite with long white and short black hairs, sternite produced and $1\frac{2}{3}$ as long as 7 with dense long white hairs apically. Terminalia black, hairs white, above on surstyli black and below at apex with a clump of crinkly black hairs; fringe brown margined with fine white hairs, subequal in length to antennae 2.

Wings hyaline, veins brown, anterior crossvein at $45/73$ length of discal cell, third vein branched at $12/28$ distance from anterior to discal crossvein, stump $1/2$ length of anterior crossvein.

FEMALE. Length 24 mm. A few more white hairs on frons. Anterior mesonotal hairs shorter than antennae 2. Scutellar hairs subequal in length to antennae 1, 6 black and 2 yellowish bristles and 2 long white hairs. Abdomen grayish pollinose, dorsum 1-6 and all of 7 brownish pollinose; hairs short white, longer on sides of 1-3, a few dorsally on 1-4 and many on 5-7. Venter grayish pollinose, hairs erect white, longer on 1-5. Ovipositor black, 5.3

←

FIGURES 158-175. Staminea Group, lateral view of the male terminalia and ovipositor of the *Efferia* species.

158. *E. argentifrons* (Hine), male terminalia.
159. *E. texana* (Banks), ovipositor.
160. *E. californica* (Schaeffer), male terminalia.
161. *E. californica* (Schaeffer), ovipositor.
162. *E. texana* (Banks), male terminalia.
163. *E. benedicti* (Bromley), ovipositor (Arizona).
164. *E. canella* (Bromley), ovipositor.
165. *E. benedicti* (Bromley), male terminalia (Washington).
166. *E. argyrosoma* (Hine), ovipositor.
167. *E. argyrosoma* (Hine), male terminalia.
168. *E. argentifrons* (Hine), ovipositor.
169. *E. pallidula* (Hine), male terminalia.
170. *E. basini*, new species, male terminalia.
171. *E. basini*, new species, ovipositor.
172. *E. benedicti* (Bromley), ovipositor (Washington).
173. *E. benedicti* (Bromley), male terminalia (Arizona).
174. *E. canella* (Bromley), male terminalia.
175. *E. pallidula* (Hine), ovipositor.

mm. long, at middle $1/8$ as wide as long. Anterior crossvein at $41/71$ length of discal cell, third vein branched at $12/30$ distance from anterior to discal crossvein.

Hine's (1919) records for Montana and Washington are doubtful. 'This is mainly a mountain species of the California Sierras, extending narrowly into Nevada through Beckwourth Pass and into southwestern Oregon.

Efferia cana (Hine).

Erax canus HINE, 1916, Ohio Jour. Sci., vol. 17, p. 32. Types male and female, Claremont, California (Carl F. Baker), OSU.

Erax canus HINE, 1919, Ann. Entomol. Soc. Amer., vol. 12, p. 145. Description and figure of male hypopygium; reports from Los Angeles County, California, Coquillett Collection, USNM.

Specimens are known from the following localities. *Arizona*: Parker, 1 May 1964 (J. M. Davidson), 8 mi. SE., 2 May 1964 (J. M. Davidson); Wellton, 24 April 1935 (F. H. Parker). *California*: Contra Costa, Fresno, Kern, Kings, Los Angeles, Madera, San Bernardino, San Luis Obispo, Santa Barbara, and Ventura counties, April to June but collected mostly in May. *Colorado*: Grand Junction, 24 May 1926 (M. C. Van Duzee). *Utah*: Leeds, 23 May 1959 (Itol J. and J. Wilcox); 3 mi. N. of St. George, 23, 24 May 1959 (Itol J. and J. Wilcox).

MALE. Length 23 mm. Head black, whitish pollinose, frons slightly golden. Hairs and bristles white, in part black on frons and ocellar tubercle. Face at antennae $46/48$ width of one eye, vertex 34. Antennae black, hairs white, segments measure 18-8-18-33.

Mesonotum black, grayish yellow pollinose, divided central stripe and intermediate spots brown. Hairs black, anteriorly $2/3$ length of antennae 1, a few white on humeri and all margins; bristles white, 3-4 slender black anterior dorsocentral. Scutellum grayish yellow pollinose, hairs dense white and longer than antennae 1-2, 17 white marginal bristles.

Abdomen black, densely white pollinose, dorsum 2-3 brown basally; hairs white parted, long on 2-3, shorter on 4-5, recumbent on 6, sparse on 7. Venter gray pollinose, hairs white, long erect on 1-3 and a few on 4. Eight black, hairs white. Terminalia black, hairs white; black above on surstyli and a few on ventral margin, at tip ventrally with a tuft of long crinkly brown hairs; fringe brown, margined with white hairs, basally as long as antennae 1-2, at apex subequal to antennae 1.

Wings hyaline, veins brown, anterior crossvein at $34/65$ length of discal cell, third vein branched at $15/31$ distance from anterior to discal crossvein.

FEMALE. Length 22 mm. Hairs and bristles of head all whitish. Discal hairs of scutellum subequal in length to antennae 1. Abdomen grayish pollinose, hairs white, longer on sides of 1-3, dorsum of 7 with short black

hairs and a few on 6. Venter gray, hairs erect white on 1-7. Ovipositor black, 3.8 mm. long, at middle $1/6$ as wide as long.

***Efferia canella* (Bromley).**

Erax canellus BROMLEY, 1934, Ann. Entomol. Soc. Amer., vol. 27, p. 95. Type male, Black Dike Prospect, Sierritas, Arizona, July 26-29, 1916, female, Coyote Mountains, Arizona, August 4-7, 1916, AMNH. Paratypes, same data, and, near Kits Peak, Baboquivari Mountains, Arizona, August 7-9, 1916; Comobabi Mountains, Arizona, August 9-10, 1916.

Specimens are known from the following counties in *Arizona*: Apache, Cochise, Maricopa, Pima, Pinal and Yuma; collected from April to November but most specimens were taken in August and September. *Mexico*: Sonora, 8 mi. S. of Sasabe, Arizona, 5 September 1964 (Earl G. Davis); 48.5 mi. S. of Hermosillo, 17 August 1964 (M. E. Irwin, P. A. Rauch).

MALE. Length 22 mm. Head black; grayish white pollinose, frons with golden tinge. Hairs and bristles white; 2-3 bristles on ocellar tubercle, about 12 upper occipitals on each side and a few hairs on palpi, black. Face at antennae $36/50$ width of one eye, vertex 29. Antennae black, hairs white, segments measure 15-9-20-22.

Mesonotum black; brownish gray pollinose, broadly divided central stripe and intermediate spots brown. Hairs black, anteriorly shorter than antennae 1, humeri with a few and anterior and lateral margins with white hairs; bristles black, no anterior dorsocentral. Scutellum gray pollinose, hairs white with a few black and subequal in length to antennae 1, 6 black marginal bristles.

Abdomen black, grayish white pollinose, dorsum of segments 2-5 basally appearing black at most angles. Hairs white, longer on sides of 1-4 and posterior margins of 2-5 but not parted. Venter grayish white pollinose, hairs long white erect, shorter on 6-7. Eight black; tergite short white haired: sternite produced and 2 times as long as 7, narrow apically with long black hairs, white hairs basally. Terminalia black, ventral margin of surstyli and lower forceps largely, reddish; hairs white, dorsum of surstyli and apical ventral margin with dense short crinkly hairs, black; fringe black, sparse, subequal in length to antennae 2.

Legs black, basal $1/2$ or more of tibiae reddish.

Wings hyaline, veins brown, anterior crossvein at $40/66$ length of discal cell, third vein branched at $12/26$ distance from anterior to discal crossvein, stump vein subequal in length to anterior crossvein.

FEMALE. Length 24 mm. Two bristles on ocellar tubercle and 8-10 occipitals black. Mesonotal hairs anteriorly very short. Scutellar hairs white and subequal in length to antennae 2. Abdomen black, gray pollinose, dorsum of 2-6 appearing black and dorsum of 7 narrowly black; hairs white short, somewhat longer on sides of 1-2, dorsum of 5-6 with a few and 7 with many

black hairs. Venter grayish pollinose, hairs erect white but much longer on 1-3. Ovipositor black, 5.0 mm. long, at middle $1/9$ as wide as long.

Bromley (1934) described as, "Femora black, reddish posteriorly." Out of 200 specimens from Arizona only about 10 percent have the femora reddish posteriorly. It has been included in the key in two places to take care of this discrepancy. All the specimens from Sonora, Mexico, had the femora reddish posteriorly.

***Efferia clementi* (Wilcox and Martin).**

Erax clementi WILCOX and MARTIN, 1945, Bull. South. Calif. Acad. Sci., vol. 44, p. 14, figures of male genitalia and female ovipositor. Types male and female, San Clemente Island, California, IV-4 1939, LAM.

No additional material has become available. San Clemente Island, the most southern of the Channel Island Group off the coast of southern California, was taken over by the Navy in World War II and is still under their control.

FEMALE. Length 19 mm. Head black; mystax formed of about 30 long slender black bristles with shorter white hairs intermixed; hairs on frons black with a few white; 4 bristles and hairs on ocellar tubercle black; upper occipitals black; beard and hairs on proboscis white; palpi largely black haired. Face at antennae $35/45$ width of one eye, vertex 25. Antennae black; hairs white, 2 black below on 1 on one side; segments measure 14-8-17-24.

Mesonotum black, grayish yellow pollinose, divided central stripe black, intermediate spots brown. Hairs black, anteriorly as long as antennae 1; humeri and all margins with white hairs. Bristles black, 4-5 slender anterior dorsocentral. Scutellum grayish brown pollinose; disc bare at middle, on each side with dense white recumbent (parted) hairs as long as antennae 1-2; 12 black marginal bristles.

Abdomen black, grayish pollinose, the dorsum appearing black; hairs white, sparse longer on sides of 1-2, dorsum 1-7 with short black hairs, numerous on 6-7. Venter grayish pollinose, hairs sparse erect white becoming shorter apically. Ovipositor black, 4.0 mm. long (allotype 5.0), at middle $1/7$ as wide as long.

Wings hyaline, veins brown, anterior crossvein at $27/54$ length of discal cell, third vein branched at $18/27$ distance from anterior to discal crossvein, stump vein $1/2$ length of anterior crossvein.

The holotype was described as 18 mm. long. The main difference between the sexes is the white parted hairs on abdominal segments 2-7, long on 2-3, somewhat shorter on 4-6, and very short on 7.

***Efferia coquilletti* (Hine).**

Erax coquilletti HINE, 1919, Ann. Entomol. Soc. Amer., vol. 12, p. 149, figure of male hypopygium. Types male and female, San Diego County, California, April (Coquillett), USNM.

Specimens are known from the following counties in *California*: Inyo, Riverside, San Bernardino, and San Diego; March to May. Practically all records are from the Colorado and Mojave deserts, mainly in March and April.

MALE. Length 15 mm. Head black; face white, frons grayish brown, occiput gray pollinose. Mystax white; hairs on frons black and white; 2 slender bristles and 5-6 hairs on ocellar tubercle black; 7-8 upper occipitals black; beard, hairs on proboscis and palpi white, apically on palpi black. Face at antennae 26/35 width of one eye, vertex 22. Antennae black, hairs white, segments measure 11-5-11-21.

Mesonotum black, grayish golden pollinose, divided central stripe and intermediate spots black. Hairs black, anteriorly quite dense and subequal in length to antennae 1; on humeri largely and on anterior and lateral margins white. Bristles black, 2-3 weak anterior dorsocentral. Scutellum grayish pollinose, sparse hairs erect white and as long as antennae 1-3, 9 white marginal bristles.

Abdomen black, 1-3 gray and 4-7 white pollinose, dorsum of 2-3 largely subshining black. Hairs white, long sparse on 2, dense long parted on 3-7. Venter gray pollinose, hairs sparse erect white. Eight dull black, hairs white. Terminalia black, base and narrow ventral margin of surstyli reddish; hairs white, a few black above on surstyli; surstyli in dorsal view 1 1/2 times as wide near apex as at base; fringe sparse brownish white, subequal in length to antennae 1.

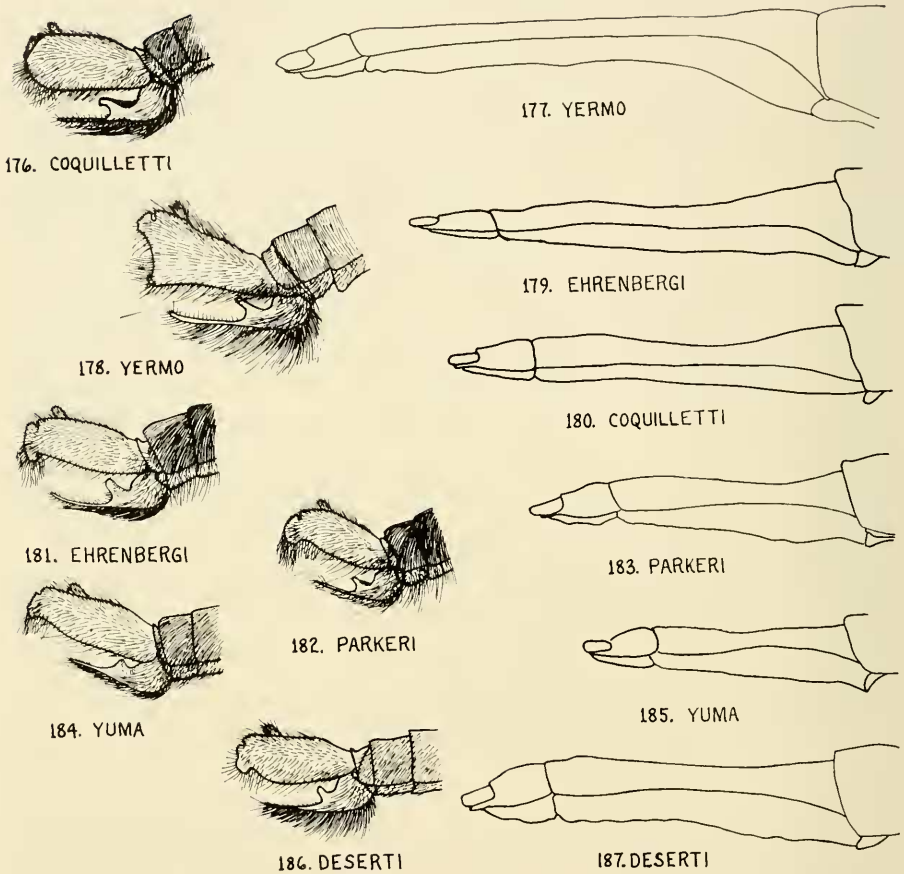
Wings hyaline, veins brown, anterior crossvein at 28/47 length of discal cell, third vein branched at 12/19 distance from anterior to discal crossvein, anterior branch of third vein ends in second vein.

FEMALE. Length 17 mm. Anterior mesonotal hairs subequal in length to antennae 2, no anterior dorsocentral bristles. Abdomen black, grayish white pollinose, basal dorsum of 2-7 subshining black; hairs white, sparse, long on sides and posterior margins of 1-5, dorsum of 2-6 basally and 7 largely with short black hairs. Venter grayish pollinose, hairs sparse erect white. Ovipositor black, 3.8 mm. long, at middle 1/8 as wide as long. Anterior crossvein at 27/48 length of discal cell, third vein branched at 14/21 distance from anterior to discal crossvein, stump vein as long as anterior crossvein.

***Efferia deserti* Wilcox, new species.**

MALE. Length 20 mm. Head black; white pollinose; hairs and bristles white, 4 hairs on ocellar tubercle and 3-6 upper occipitals black. Face at antennae 37/45 width of one eye, vertex 34. Antennae black, hairs white, segments measure 18-8-14-27.

Mesonotum black; grayish pollinose; divided central stripe and intermediate spots black. Anterior central hairs black and subequal in length



FIGURES 176-187. Staminea Group, lateral view of the male terminalia and ovipositor of the *Efferia* species.

- 176. *E. coquilletti* (Hine), male terminalia.
- 177. *E. yermo*, new species, ovipositor.
- 178. *E. yermo*, new species, male terminalia.
- 179. *E. ehrenbergi*, new species, ovipositor.
- 180. *E. coquilletti* (Hine), ovipositor.
- 181. *E. ehrenbergi*, new species, male terminalia.
- 182. *E. parkeri*, new species, male terminalia.
- 183. *E. parkeri*, new species, ovipositor.
- 184. *E. yuma*, new species, male terminalia.
- 185. *E. yuma*, new species, ovipositor.
- 186. *E. deserti*, new species, male terminalia.
- 187. *E. deserti*, new species, ovipositor.

to antennae 2, posteriorly long black, short black on intermediate spots, otherwise white. Bristles white, 2 presutural, 2 supraalar, 2 postalar, 6-7 weak posterior dorsocentral. Pleura and coxae black, gray pollinose, hairs white. Scutellum black, gray pollinose, hairs erect white and subequal in length to antennae 1-3, 16 weak white marginal bristles.

Abdomen black, white pollinose; hairs white, parted on 2-7 but appressed and not extending over margins on 5-7; 8-9 white lateral bristles on 1. Venter white pollinose, hairs white, erect on 1-4, appressed on 5-7. Segment 8 black, hairs white, tergite white pollinose. Terminalia black, hairs white; surstyli in dorsal view $1\frac{1}{2}$ times as wide at apex as at base; fringe on lower forceps dense and basally as long as antennae 1 becoming shorter apically.

Femora black, tibiae yellowish red, tips of tibiae and tarsi brown. Hairs and bristles white, short bristles below on tarsi black. Claws black, base reddish; empodia and pulvilli brownish.

Halteres brown, stem lighter brown. Wings hyaline, veins brown, anterior crossvein at $33/60$ length of discal cell, third vein branched at $22/27$ distance from anterior to discal crossvein, stump vein $1/2$ length of anterior crossvein, anterior branch of third vein ends at junction of costa and second vein.

FEMALE. Length 19 mm. One hair on ocellar tubercle and 3 occipitals on each side black. Dorsum of abdominal segments 6-7 narrowly black; hairs sparse white, parted on 2-4. Ovipositor brownish black, 3.2 mm. long, at middle $1/6$ as wide as long. Anterior crossvein at $33/56$ length of discal cell, third vein branched at $21/23$ distance from anterior to discal crossvein, stump vein as long as anterior crossvein, anterior branch of third vein ends in costa near the second vein.

HOLOTYPE. Male, 10 mi. E. of Desert Center, California, 13 April 1941 (J. Wilcox, Jr.)

ALLOTYPE. Female, same data.

PARATYPES. *California*: 1♀, Amboy Crater, 24 April 1960 (J. Powell), CIS; 2♂♂, 13 mi. E., 12 April 1958 (J. W. MacSwain), CIS; 1♀, 4 mi. E. of Ballarat, Inyo County, 9 April 1955 (R. F. Smith), CIS; 5♂♂, 5♀♀, 18 and 22 mi. W. of Blythe, 9 April 1963, 12 April 1951, 13 April 1957, 29 April 1952 (J. C. Hall, P. H. Timberlake), UCR; 2♂♂, 1♀, Borego, 24 April 1949, 1954, 26 April 1955 (P. D. Hurd, L. W. Quate, J. G. Rozen), CIS; 1♀, 27 April 1955 (P. H. Timberlake), UCR; 7♂♂, 10♀♀, dunes and Palm Canyon, 6, 7 April 1964, 18-20 April 1957 (R. C. Bechtel, R. M. Bohart, R. W. Bushing, J. C. Hall, H. R. Moffitt, P. M. Marsh, F. D. Parker, E. I. Schlinger), UCD; 1♂, 2♀♀, Barstow, 31 May 1941 (J. Wilcox), JW; 1♀, Box Canyon, Riverside County, 26 April 1952 (P. D. Hurd), CIS; 1♂, Colorado Desert, 1 March 1933 (R. M. and G. E. Bohart), UCD; 1♂, Cronise Valley, 29 April 1956 (J. Powell) *Prosopis*, CIS; 1♀, Daggett, San Bernardino County, 3 June 1948, CIS; 10♂♂, 9♀♀, 10, 20 and 23 mi. E.

of Desert Center, 27 March, 13 April 1941 (N. R. Anderson, J. C. Elmore, Itol J., J. Jr., and J. Wilcox), JW; 1 ♂, 1 ♀, 18 mi. E., 1 March 1933, 13 April 1949 (P. H. Timberlake), UCR; 2 ♀ ♀, 4, 5 mi. E. of Edom, 19 April 1937 (P. H. Timberlake), UCR; 27 ♂ ♂, 32 ♀ ♀, Hopkins Well, 14-16 April 1958, 27, 28 April 1949, 29 April 1952 (P. D. Hurd, J. E. Gillaspay, G. A. Marsh, J. Powell, L. W. Quate, J. G. Rozen, R. F. Smith), CIS; 6 ♂ ♂, 29 ♀ ♀, Indio, 16, 29 March, 20-30 April 1941, 5 April 1942 (N. R. Anderson, Itol J., J. Jr., and J. Wilcox), JW; 1 ♂, 1 April 1948 (J. W. MacSwain), CIS; 2 ♂ ♂, 1 ♀, Kane Springs, Imperial County, 9, 12 April 1952 (E. G. and Joan Linsley, J. W. MacSwain), CIS; 3 ♂ ♂, Kramer, 22 May 1938 (A. F. Howland), JW; 1 ♂, 11 ♀ ♀, La Quinta, 11 April 1948 (Guy F. Toland, J. Wilcox), JW; 2 ♂ ♂, Lone Pine, 7 May 1961, 1 June 1941 (R. M. Bohart), UCD; 3 ♂ ♂, 1 ♀, 1 mi. N., 12 June 1964 (M. E. Irwin), UCR; 1 ♂, Manix, 25 April 1953 (P. H. Timberlake), UCR; 4 ♂ ♂, 6 ♀ ♀, Mecca, 13 April 1941 (N. R. Anderson, Itol J., J. Jr., J. Wilcox), JW; 2 ♀ ♀, 10 mi. S., 4 April 1937 (P. H. Timberlake), UCR; 6 ♂ ♂, 3 ♀ ♀, Needles, 3 April 1941 (E. G. Linsley, J. W. MacSwain, G. E. Bohart), CAS; 2 ♂ ♂, 1 ♀, 22 mi. S. of Oasis, 30 March, 20 April 1941 (J. Jr., and J. Wilcox), JW; 2 ♂ ♂, 13 ♀ ♀, 4 mi. SE. of Ocotillo Wells (Dry Lake), 4 April 1942 (W. Schweikhard, J. Jr., and J. Wilcox), JW; 1 ♂, Palmdale, 3 May 1941 (J. Wilcox), JW; 23 ♂ ♂, 15 ♀ ♀, 3 mi. S. of Palo Verde, 8 April 1949, 9 April 1963, 30 April 1952 (P. D. Hurd, R. L. Langston, J. Powell, W. A. Steffan), CIS; 1 ♀, 5.1 mi. E. of Thousand Palms, 3 April 1955 (P. H. Timberlake), UCR; 2 ♂ ♂, Yermo, 28 April 1949 (E. G. Linsley, J. W. MacSwain, R. F. Smith), CIS; 3 ♂ ♂, 19 ♀ ♀, 31 May 1941 (Dan F. and Guy F. Toland, J. Jr., and J. Wilcox), JW. *Arizona*: 1 ♂, 2 ♀ ♀, Ehrenberg, 14 April 1941 (J. Jr. and J. Wilcox), JW; 3 ♀ ♀, Topoc, 13 April 1958 (J. W. MacSwain), CIS.

Efferia dubia (Williston).

Erax, n. sp. (*dubius* in key) WILLISTON, 1885, Trans. Amer. Entomol. Soc., vol. 12, pp. 68, 64.

Type male, Washington Territory, UK. One specimen from Arizona.

Hine (1919) says the specimen from Washington is lost and the specimen from Arizona is labeled "type" at the University of Kansas. He says several specimens from Wyoming agree with the type specimen of *E. dubius* (from Arizona) and he regards *E. dubius* as no more than a variety of *E. stramineus* if not a synonym.

No specimens of *E. staminea* have been seen from either Washington or Arizona. The only similar species from Arizona is *E. rapax* (Osten Sacken) which could be a synonym of *E. dubia* if the specimen from Arizona was considered to be the type. However, the *Erax*, n. sp. (p. 68) briefly described by Williston was based on the Washington specimen and it is not certain

that the name *E. dubius* in the key (p. 64) refers to this species. It would seem best to consider "*dubia*" as a *nomen nudum*.

***Efferia ehrenbergi* Wilcox, new species.**

MALE. Length 14 mm. Head black; face white, frons thinly and occiput densely grayish white pollinose. Mystax white; hairs on frons mostly black, a few white to sides of antennae; 4 black bristles on ocellar tubercle; occipital bristles black; beard, hairs on proboscis and below on palpi white, apically on palpi black. Face at antennae 25/37 width of one eye, vertex 20. Antennae black, hairs white, segments measure 12-6-12-20.

Mesonotum black, thinly grayish pollinose, central stripe black. Hairs black, anteriorly subequal in length to antennae 1; a few on humeri and lateral margins white. Bristles black, 2 presutural, 2 supraalar, 3 postalar, 4-5 weak posterior and 2-3 anterior dorsocentral. Pleura and coxae thinly grayish pollinose, hairs and bristles white, a few black hairs on mesopleura. Scutellum gray pollinose, erect hairs white with several black and subequal in length to antennae 1-2, 7 black marginal bristles.

Abdomen black, segments 1-2 and basal 1/2 of 3 thinly grayish pollinose, apex of 3 and 4-7 white pollinose. Hairs white, long parted on 3-7. Venter grayish pollinose, thinly on 1-3, hairs long erect white. Eight black, hairs white, longer on sternite. Terminalia brown, hairs white, black basally on dorsum of surstyli; fringe black, at base subequal in length to antennae 1, shorter apically.

Femora black, tibiae yellowish red, tips and the tarsi brown. Hairs white, a few below at apex of femora black. Bristles on femora mostly black, on tibiae and tarsi mostly white. Claws black, base reddish; empodia and pulvilli brownish.

Halteres brownish, stem lighter. Wings hyaline, veins brown, anterior crossvein at 31/50 length of discal cell, third vein branched at 15/19 distance from anterior to discal crossvein; stump vein long, anterior branch of third vein ends at tip of second vein.

FEMALE. Length 16 mm. Mesonotum grayish brown pollinose. Seven white and 2 black scutellar bristles. Abdomen grayish pollinose, dorsum 2-7 brownish pollinose, subshining black; hairs sparse white, longer on sides and posterior margins of 1-6, 2-7 with short black hairs dorsally. Venter grayish pollinose, hairs sparse erect white. Ovipositor black, basal 1/3 tapered, 4.3 mm. long, at middle 1/8 as wide as long. Anterior crossvein at 27/45 length of discal cell, third vein branched at 10/18 distance from anterior to discal crossvein, anterior branch of third vein ends in second vein.

HOLOTYPE. Male, 35 mi. E. of Ehrenberg, Arizona, 14 April 1941 (J. Wilcox, Jr.).

ALLOTYPE. Female, same data.

PARATYPES. *Arizona*: 7 ♂♂, 19 ♀♀, same data (N. R. Anderson, Itol J., J., Jr. and J. Wilcox); 4 ♂♂, 6 ♀♀, Ehrenberg, 8 April 1964, 10 April 1948, 14 April 1941 (N. R. Anderson, Itol J., J., Jr. and J. Wilcox); 1 ♂, 1 ♀, Palm Canyon, Kofa Mountains, Yuma County, 8 April 1963 (D. E. Bright), CIS; 1 ♂ (E. I. Schlinger), UCR; 3 ♀♀, 20 mi. S. of Quartzite, 9 April 1964 (M. W. Stone, J. Wilcox); 3 ♂♂, 2 ♀♀, 50 mi. N. of Yuma, 17 April 1965 (M. A. Cazier), ASU. *California*: 2 ♀♀, 5 mi. N.E. of Ogilby, Imperial County, 24 April 1955 (David Cox), ASU, appear to be this species but are not made paratypes because of their rather poor condition.

***Efferia inflata* (Hine).**

Erax inflatus HINE, 1911, Ohio Nat., vol. 11, p. 310. Types male and female, Los Angeles County, California (F. Grinnell, Jr.), OSU.

Erax inflatus HINE, 1919, Ann. Entomol. Soc. Amer., vol. 12, p. 146. Description of male and female; reports from Los Angeles, Kern, and San Bernardino counties, California, Coquillett Collection.

Specimens are known from the following counties in *California*: Los Angeles, Orange, Riverside, San Bernardino, and San Diego; April to July. Found mostly at lower elevations but occurs up to 4000 feet in the San Jacinto Mountains.

MALE. Length 21 mm. Head black; white pollinose, frons grayish brown. Mystax white with 2-3 black bristles below on the side; hairs on frons black, white near antennae; 3 black bristles and several black hairs on ocellar tubercle; 6-8 upper occipitals black; beard, hairs on proboscis and palpi white, several black apically on palpi. Face at antennae 38/48 width of one eye, vertex 30. Antennae black, hairs white, segments measure 15-8-18-25.

Mesonotum black; grayish pollinose, divided central stripe and intermediate spots brown. Hairs black, anteriorly as long as antennae 2 and at suture as long as antennae 1, humeri and margins white haired; bristles black, no anterior dorsocentral. Scutellum grayish brown pollinose, hairs white and as long as antennae 1-2, 7 slender black and 7 white marginal bristles.

Abdomen black, white pollinose; hairs white, parted on 2-5 but shorter on 4-5. Venter gray pollinose, hairs erect white on 1-4 with several black on 3-4, short white on 5-7. Eight black, hairs white. Terminalia black, in dorsal view 2.5 mm. wide apically and half this wide at base; hairs white, a few black on ventral margin of surstyli; fringe brown margined with white, at base subequal in length to antennae 1-2, apically subequal to antennae 1.

Wings hyaline, veins brown, anterior crossvein at 36/61 length of discal cell, third vein branched at 16/25 distance from anterior to discal crossvein, stump vein as long as anterior crossvein.

FEMALE. Length 23 mm. Mystax with 3-4 black bristles on sides below and 6 above. Four to 5 slender black anterior dorsocentral bristles. Scutellar hairs white and subequal in length to antennae 1; 16 black and 4 yellowish marginal bristles. Abdomen grayish white, a brownish basal spot at center of 2-5, dorsum 6-7 largely brown; hairs white, longer on sides of 1-3, a few short black dorsally on 5-6 and many on 7. Venter gray pollinose, hairs erect white, in part black on 3-4 and 6-7. Ovipositor black, 4.8 mm. long, at middle $1/5$ as wide as long, tergite 8 at base ventrally with a rounded tubercle on each side. Anterior crossvein at $35/65$ length of discal cell, third vein branched at $16/30$ distance from anterior to discal crossvein.

See note under *E. neoinflata*.

Efferia interrupta (Macquart).

Asilus interruptus MACQUART, 1834, Histoire naturelle des insectes.—Dipteres. Paris. Vol. 1, p. 310. Type, Georgia, "location unknown," Martin (1965).

Erax interruptus, HINE, 1919, Ann. Entomol. Soc. Amer., vol. 12, p. 153. Description and figure of male hypopygium; widely distributed in the South, reaching from coast to coast, from the latitude of Kansas to Guatemala and even farther south.

Bromley (1934) records this species from ten counties in Texas, May 1-Oct. 19.

James (1941) reports it from Colorado, July-August.

Fattig (1945) reports from many localities in Georgia, June-September.

Bromley (1950) reports from many localities in Florida, June-September. Calls it "The Snorey Joe Fly or the Pathfinder Fly."

Martin (1965) lists *E. perrumpeus* (Walker), *E. concolor* (Walker), and *E. villosus* (Bellardi) as synonyms.

Martin and Wilcox (1965) list *E. lateralis* (Macquart) and *E. ambiguus* (Macquart) as synonyms.

Specimens are known from the following states: Alabama, Arizona, Arkansas, California, Florida, Kansas, Nevada, New Mexico, South Carolina, Tennessee, Texas, and Utah.

MALE. Length 22 mm. Head reddish; face and occiput white, frons yellowish pollinose. Mystax yellowish white, 2 black bristles below and 4 above; frontal hairs yellowish with 1-2 black; short black hairs on ocellar tubercle; 4 upper occipitals black, remainder yellowish; beard and hairs on proboscis white; palpi black haired with a few yellowish. Face at antennae $50/53$ width of one eye, vertex 51. Antennal segments 1-2 reddish, 3 and style black; hairs mostly yellowish below, black above; segments measure 19-9-27-33.

Mesonotum reddish, central stripe and intermediate spots brown; yellowish gray pollinose, humeri and lateral margins white, broad divided central stripe brown. Hairs short black; a few white anteriorly, on humeri and

laterally behind suture. Bristles black, no anterior dorsocentral. Scutellum white pollinose; hairs white with 3-4 black at middle, subequal in length to antennae 1; 7 strong and 2 weaker black marginal bristles.

Abdomen black basally, apical segments brown to reddish; 1, sides of 2-5 and interrupted posterior margins 2-3 gray pollinose; 6-7 white. Hairs white, long on sides 1-3; dorsum 2-3, 4-5 largely and a few on 6, short black. Venter 1-5 gray, 6-7 white; hairs erect white 1-3, short 4-7. Eight and 9 reddish, thinly pollinose; short white haired, 9 with tuft of long white hairs at apex; sternite 8 short, 9 produced and 2 times as long as 8. Terminalia reddish, hairs yellowish white; fringe yellowish white, sparse and subequal in length to antennae 2.

Dorsum of femora reddish.

Wings hyaline, veins light brown, anterior crossvein at 45/80 length of discal cell, third vein branched at 20/35 distance from anterior to discal crossvein, stump as long as anterior crossvein.

FEMALE. Length 25 mm. Hairs on head white or yellowish; 1 black occipital and hairs on palpi largely black. Humeri mostly white haired. Scutellar hairs very short, mostly white, a few black; 5 black and 2 yellowish marginal bristles. Abdomen grayish pollinose; base and narrow dorsum 2-3, 4-5 broadly and 6-7 narrowly black; hairs short white, longer on sides 1-2; narrow dorsum 2-3 and 6-7, and 4-5 broadly short black haired. Venter gray, hairs all short white. Ovipositor tubular; black, venter largely and dorsum in part reddish; 3.3 mm. long, at middle 1/4 as wide as long.

Efferia knowltoni (Bromley).

Erax knowltoni BROMLEY, 1937, Utah Acad. Sci., Arts and Letters, vol. 14, p. 104, figure of male genitalia. Type male and female, Trout Creek, Utah, 5-6, 1934 (C. F. Smith) USU or USNM. Paratype, Milford, Utah, June, no. 254.

"Total length, 15-17 mm. A small species of the *stramineus* group having the furcation of the third vein at the middle of the distance between the base of the second posterior cell and the small cross-vein. The abdomen of the male has long silvery pile parted at the middle and directed outward on segments 2 to 7. The mystax is wholly whitish and the bristles of the legs are black. The hypopygium is not notched on the apical border. The species runs to *pallidulus* Hine in Hine's key, but is smaller and the genitalia differ.

"MALE. Mystax, beard, antennal bristles and most of palpal hairs, whitish. Most of occipital hairs white, but there are some black bristles in back of the upper border of the eyes. The ocellars and most of the hairs on the vertex are black. Mesonotum brownish-gray pollinose with the usual black markings; most of the hairs here black although there is a small white tuft at the anterior dorsal angle and there are also white hairs above the bases of the wings. The scutellum bears many yellowish-white bristles. Pleura gray pollinose with white hairs. Coxae with white hairs and bristles. Legs black, except basal half of tibiae which are pale reddish and the pulvilli which are pale brownish-yellow. Bristles of legs black; fine pile white. Wings hyaline with black veins. Halteres pale yellowish-brown. Abdomen black, tergites silvery, except anterior portions of first and second which are grayish. Tergites 2-7 bear abundant fine pile, silvery-white, directed outward, leaving a

part along the median dorsal line. First tergites with yellowish-white hairs and bristles. Genitalia black with some black and some white hairs (Fig. 5).

"FEMALE. Similar. Abdomen silvery pollinose with short, fine white pile. Ovipositor shining black about as long as segments 4-7, together."

The figure does not show sternite 8 produced so it would not be close to *E. pallidula*.

Several specimens from Nevada that are close to *E. coquilletti* (Hine) fit the description fairly well but not well enough to say that they definitely belong to this species.

***Efferia mesquite* (Bromley).**

Erax mesquite BROMLEY, 1951, Amer. Mus. Novitates, no. 1532, p. 27. Type male, Starr County, Texas, July 23, 1933 (S. W. Bromley); female, Donna, Texas, July 1935 (J. W. Monk), AMNH. Paratypes, same data as for the female.

"Total length, 13 mm. A small fragile species of the *stramineus* group, having the furcation of the third vein at the middle of the distance between the base of the second posterior cell and the small cross vein; the abdomen with long white hair parted at the middle and directed outward, the mystax white, and the legs red, with black tibiae. Related to *canus* Hine but much smaller and slenderer, the hypopygium lacking the tuft of hair below at apex, and to *pilosus* Hine, from which it differs in having the scutellum and posterior portion of mesonotum with black bristles, not white, and the slender hypopygium, as viewed from above, not swollen towards the tip.

"MALE: Head black, grayish white pollinose. Mystax and beard white. Ocellars and occipitals black; palpi black, white-haired. Antennae black, with white hairs and bristles. Mesonotum pale brown pollinose, with darker indistinct markings; the hairs and bristles black. Pleura gray pollinose, white-haired. Scutellum with black hairs and bristles. Wings hyaline, iridescent. Halteres pale brown. Legs with white hairs and black bristles. Femora black. Tibiae and tarsi red, with blackish tips. Abdomen black, white pollinose, with long, white, outwardly directed hairs, parted along the middorsal line. Genitalia black, with black and some pale hairs. Seen from above, narrower than sixth segment, sides parallel, not swollen at tip; from side, general outline cylindrical. Seventh sternite with a little tuft of black hairs.

"FEMALE: Similar, but with pollen of head and mesonotum with slightly more of a yellow tinge, the hairs on disc of scutellum whitish. The abdomen gray-white pollinose, and tergite with the large central anterior portion blackish. Ovipositor black, about the length of the preceding five abdominal segments."

This species has not been seen by me.

***Efferia monki* (Bromley).**

Erax monki BROMLEY, 1951, Amer. Mus. Novitates, no. 1532, p. 28.

Type male, Donna, Texas, October 1, 1933 (J. W. Monk); female same data, September 30, 1933, AMNH. Paratypes, same data, September 24 to October 8, 1933.

"Total length, 18-21 mm. A brown species of the *stramineus* group, having the furcation of the third vein distinctly beyond the middle of the

distance between the base of the second posterior cell and the small cross vein, the femora entirely black, the mystax sordid white, the scutellum with black hair and bristles (in female, the hair and some of the bristles pale yellowish). Related to *nemoralis* Hine, from which it can be distinguished by its smaller size, more slender build; hyaline wings, the white hairs of mystax, beard, coxae, and legs in the male not bright yellow as in *nemoralis*, and the genitalia (from side view) more rounded at tip. In the female, *monki* differs from *nemoralis* in having the hairs whiter, the bristles of scutellum partly yellowish, the femora gray pollinose, and the abdomen gray pollinose above, without the median dark markings of *nemoralis*.

"MALE: Head black, pale gray-yellow pollinose. Beard, mystax, palpal hairs sordid whitish. Occipital and ocellar bristles and bristles of vertex black. Thorax yellowish brown pollinose, mesonotum with brown median and lateral vittae. Hairs and bristles of mesonotum and scutellum black. Pleura brown pollinose, with pale hairs. Hypopleural bristles black. Hairs of coxae and legs sordid white. Legs black; external basal portion of tibiae red; bristles black. Wings hyaline, halteres brown. Abdomen black, posterior margin of segment 3 and all of segments 4, 5, 6, and 7 silvery pollinose, with long, white, outwardly projecting hairs parted along median dorsal line on all except seventh of those that are silvery pollinose. The base of abdomen black haired above. The genitalia black, upper forceps enlarged as in *nemoralis* but more rounded and truncate, when viewed from the side.

"FEMALE: Thorax lighter colored, with more pale hairs. Scutellum with pale hairs on disc and some pale marginal bristles. Abdomen gray pollinose, with very short, pale, scattered hairs."

This species has not been seen by me.

***Efferia nemoralis* (Hine).**

Erax nemoralis HINE, 1911, Ohio Nat., vol. 11, p. 311. Types male and female, New Roads, Louisiana, July 15, 1905 (J. S. Hine), OSU.

Erax nemoralis HINE, 1919, Ann. Entomol. Soc. Amer., vol. 12, p. 147. Description and figure of the male hypopygium; reports other specimens from Texas and Falls Church, Virginia.

Bromley (1931) reports this species from *Ohio*: Prairie, Higby, and Ross counties, June 20, 1931 (E. S. Thomas, Charles F. Walker).

Bromley (1934) reports from following localities in *Texas*: Iowa Park, May 30, 1932 (S. E. Jones); Madison County, June 21, 1931 (Bibby and Tate); Stafford, May 3, 1929; says, "Quite common in the Trinity River bottoms. An active species, flying with a shrill buzz."

Specimens are known from the following localities. *Kansas*: Baldwin, 4 July 1906 (J. C. Bridwell); Douglas County, 12 June 1923 (C. O. Bare); Johnson County, 1931 (R. H. Beamer); Lyon County, 14, 15 June 1923 (C. O. Bare, W. J. Brown); Miami County, 1915 (R. H. Beamer); Osage County, 14 June 1923 (W. J. Brown); Sedgwick County, 1,291 feet, 1916 (R. H. Beamer). *Oklahoma*: Craig County, 18 June 1931 (Maxwell and Las-

siter); McCurtain County, 9 June 1931 (C. C. Deonier). *Texas*: Corsicana, 16 May 1933; Greenville, 13 June 1935; Liberty, 10 June 1934; Madison, 23 June 1934 (H. J. Reinhard).

MALE. Length 22 mm. Mystax yellowish; beard and hairs on proboscis yellowish white; hairs on frons, hairs and bristles on ocellar tubercle, occipital hairs and bristles largely, and hairs on palpi largely, black. Face at antennae 50/47 width of one eye, vertex 41. Antennae black, hairs above black, mostly yellowish below; segments measure 19-10-21-33.

Mesonotum black, yellowish brown pollinose, central stripe and intermediate spots brown. Hairs black, anteriorly subequal in length to antennae 1, a few yellowish laterally behind suture. Bristles black, 4-5 slender anterior dorsocentral. Scutellum brownish pollinose, hairs black and as long as antennae 1-2, 10 black marginal bristles.

Abdomen black, segment 1 gray, 2, 3, and 7 brown, 4-6 whitish pollinose. Hairs black on 1-2 and dorsum of 3, white on 4-6 and apically on 3, long parted apically on 3-4; yellowish on 7. Venter 1-3 yellowish brown pollinose, 4-7 white; hairs long yellowish on 1-3, long white on 4, short white on 5-7. Eight brown, hairs short black and yellowish on tergite, long yellowish on sternite. Terminalia black, hairs yellowish, black on dorsum of surstyli and in part on sides and ventral margin; fringe brown, margined with yellow, as long as antennae 1-2 basally, short at apex.

Wings slightly yellowish, veins light brown, anterior crossvein at 31/61 length of discal cell, third vein branched at 25/30 distance from anterior to discal crossvein, stump as long as anterior crossvein.

FEMALE. Length 29 mm. Anterior mesonotal hairs subequal in length to antennae 2. Scutellar hairs mostly yellow, some black, subequal in length to antennae 1; 7 black marginal bristles. Abdomen 1, sides and posterior margins 2-5 gray, sides of 6 brownish, dorsum of 2-6 and 7 all brownish appearing black; hairs yellow on sides, mostly short black on dorsum, longer yellowish on 1 and 4-5 black lateral bristles. Venter grayish pollinose, 7 brown; hairs erect white, longer on basal segments. Ovipositor black, 5.9 mm. long, narrowest at middle, 1/10 as wide as long.

Females from Kansas and Oklahoma have the ovipositor 4.4 mm. long, while those from Texas are 6.3 mm. long.

Efferia neoinflata Wilcox, new species.

MALE. Length 19 mm. Head black, white pollinose, frons yellowish brown. Mystax white, about 16 oral and 10 bristles above black; frons black haired; 2 bristles and 4-5 hairs on ocellar tubercle black; occipital bristles mostly black; beard, hairs on proboscis and below on palpi white, black apically on palpi. Face at antennae 45/52 width of one eye, vertex 32. Antennae black, hairs white, segments measure 18-7-18-35.

Mesonotum black, grayish pollinose, divided central stripe black, intermediate spots brown. Hairs black, anteriorly subequal in length to antennae 1, a few white laterally behind suture. Bristles black, 2 presutural, 2-3 supraalar, 3-4 postalar, 5-6 posterior and 4-5 anterior weaker dorsocentral. Pleura and coxae brownish pollinose, hairs on coxae and hypopleura white, others mostly black. Scutellum brownish pollinose, hairs black with a few white and subequal in length to antennae 1-2; 8 black marginal bristles.

Abdomen black, grayish white pollinose, dorsum 2-3 broadly subshining black, narrow dorsum 4-7 brownish. Hairs white, parted apically on 2 and on 3, short parted on 4, very short on 5-7; dorsum of 2 broadly and 3 dorsally with a few black; 1 white laterally and black dorsally, 3-4 black lateral bristles. Venter grayish brown pollinose, 3-4 bare at middle; hairs long erect on 1-3, largely black on 1-4 and largely white on 5-7, longer apically on 7. Eight black, hairs white, a few short black on tergite and 5-6 long black on sternite. Terminalia black, in dorsal view 2.3 mm. wide apically, base $5/8$ as wide; hairs white, dorsum and ventral margin of surstyli with black hairs; fringe brownish black margined with sparse white hairs, at base $1\frac{1}{2}$ times length of antennae 1-2, at apex subequal in length to antennae 1.

Legs black, basal half of tibiae yellowish red. Hairs white, black below on femora and above on tips, dorsally and posteriorly on fore tibiae, a few dorsally on fore and middle tarsi and hind tarsi largely black haired. Bristles black, in part yellowish on fore and middle tarsi; claws black, base reddish; empodia and pulvilli brownish.

Halteres brown, stem light brown. Wings lightly tinged with brown, veins brown, anterior crossvein at $38/68$ length of discal cell, third vein branched at $19/30$ distance from anterior to discal crossvein, stump as long as anterior crossvein.

FEMALE. Length 24 mm. Mystax with 3 black bristles on each side below and 4 above; hairs on frons in part white; 4-6 occipital bristles black. Humeral hairs largely white and all margins of mesonotum with white hairs. Scutellar hairs white subequal in length to antennae 1; 11 black marginal bristles. Abdomen grayish pollinose, dorsum 1-7 black with short black hairs; short white otherwise, longer on sides of 1-2. Venter grayish pollinose, hairs erect black and white, mostly white on 1-2. Ovipositor black with a small swelling at base ventrally, 5.3 mm. long, at middle $1/6$ as wide as long. Hairs on legs mostly white, bristles all black. Anterior crossvein at $40/75$ length of discal cell, third vein branched at $22/35$ distance from anterior to discal crossvein.

HOLOTYPE. Male, Yosemite Fork, Madera County, California, 8 June 1940 (B. Brookman, T. Aitken, M. Cazier), CAS.

ALLOTYPE. Female, North Fork, same data as above.

PARATYPES. *California*: 3 ♂♂, 3 ♀♀, same data as holotype; 2 ♂♂, 3 ♀♀, same data as allotype; 2 ♂♂, Bass Lake, Madera County, 13 May 1947 (H. Welsh), CIS; 1 ♂, 6 June 1940 (E. C. Van Dyke), CAS; 1 ♂, 1 ♀, 7 mi. NW. of Big Pines, Los Angeles County, 2 June 1965 (J. Wilcox), JW; 1 ♂, Bluff Camp, San Rafael Mountains, Santa Barbara County, 29 June 1959 (A. S. Menke), UCD; 1 ♂, 2 ♀♀, Hungry Valley, 5 mi. S. of Gorman, Ventura County, 4, 5, 19 May 1959 (J. Powell, J. R. Powers, G. I. Stage), CIS; 15 ♂, 9 ♀, Figueroa Mountains, Santa Barbara County, 17-30 June, 1, 7 July 1965 (C. W. Kirkwood), JW; 1 ♂, 5 mi. N. of Kernville, Kern County, 15 May 1963 (S. W. Earnshaw), CIS; 2 ♀♀, La Panza Camp, 12 mi. NE. of Pozo, San Luis Obispo County, 29 April 1962 (R. L. Langston, J. Powell), CIS; 2 ♂♂, Mariposa, 7 June 1940 (B. Brookman, M. Cazier, T. Aitken), CAS; 1 ♂, Mill Potrero, Kern County, 8 July 1959 (W. A. Steffan), CIS; 1 ♂, 6 July 1959 (A. S. Menke), UCD; 3 ♂♂, 3 ♀♀, Moke-lumne Hill, 6 June 1896 (F. E. Blaisdell), CAS; 1 ♀, Mormon Bar, Mariposa County, 6 July 1940 (M. Cazier), AMNH; 1 ♀, North Fork, Madera County, 8 June 1940 (M. Cazier), AMNH; 1 ♀, 2.8 mi. N. of North Fork, Madera County, 20 June 1963 (J. A. Chemsak), CIS; 1 ♀, Oakhurst, 26 May 1962 (E. G. Linsley), CIS; 1 ♂, 1 ♀, 3 mi. NE. of Pinnacles National Monument, San Benito County, 27 April 1962, 6 May 1963 (P. D. Hurd, R. W. Thorp), CIS; 3 ♂♂, 1 ♀, Potwisha, Sequoia National Park, 2,000-5,000 feet, 17, 24, 26 May 1929 (E. C. Van Dyke), CAS; 1 ♂, 2 June 1964 (J. Wilcox), JW; 1 ♀, San Joaquin Experimental Range, Madera County, 12 May 1946 (P. D. Hurd), CIS; 2 ♂♂, 8 ♀♀, 3.5 to 6 mi. NE. of Santa Margarita, San Luis Obispo County, 2 to 5 May, 8, 9 June 1962 (P. D. Hurd, J. Powell, G. I. Stage, C. A. Toschi), CIS; 1 ♂, 1 ♀ (P. H. Timberlake), UCR; 1 ♀, Shaver Lake, 6 June 1939 (M. Cazier), CAS; 1 ♂, Tejon Canyon, Kern County, 12 May 1927 (E. C. Van Dyke), CAS; 1 ♂, Usona, Mariposa County, 7 June 1940 (T. Aitken, M. Cazier, B. Brookman), CAS; 3 ♀♀, Wrightwood, San Bernardino County, 30 June 1964 (M. W. Stone, Itol J. and J. Wilcox), JW; 2 ♂♂, 2 ♀♀, 14 June 1959 (J. C. and E. M. Hall), UCD; 2 ♂♂, 4 ♀♀, Yosemite Forks, Mariposa County, 8 June 1940 (M. Cazier), AMNH.

A few specimens of this species and *inflata* (Hine) have the mystax all white and cannot be identified by the key. The males are easily recognized by the broad surstyli in dorsal view and the females can be placed by the swelling or tubercles at the base of tergite 8. In *E. inflata* these swellings or tubercles are well developed and usually extend well below sternite 8 but in *E. neoinflata* they are small and not always easily seen.

Efferia pallidula (Hine).

Erax pallidulus HINE, 1911, Ohio Nat., vol. 11, p. 309. Type male, Albuquerque, New Mexico (J. R. Watson), OSU.

Erax pallidulus HINE, 1919, Ann. Entomol. Soc. Amer., vol. 12, p. 144. Description of male and female, figure of male hypopygium, reports from Colorado.

James (1941) reports this species from *Colorado*: Las Animas, August 13, 1933 (Leonard Sweetman); La Veta, July 22, 1929 (Rodeck); Saguche, July 20, 1929 (Rodeck); on Two Buttes, August 1, 1933 (Rodeck and James); Two Buttes Reservoir, August 1, 1933 (Rodeck and James).

Specimens are known from the following localities. *Kansas*: Cheyenne County, 1 July 1925 (H. J. Grady); Gove County, 2,813 feet (F. X. Williams); Marion County, 23 June 1923 (W. J. Brown). *New Mexico*: Bernallilo County, 27 June 1929 (R. H. Beamer); Carrizozo, 3 August 1923 (K. C. Doering); Cowles, 18 July 1936 (J. D. Beamer); Roswell, 16 July 1936 (D. R. Lindsay); Santa Rosa, 26 June 1932 (R. H. Beamer); Socorro, 2 July 1936 (D. R. Lindsay, M. B. Jackson).

MALE. Length 21 mm. Head black, white pollinose, hairs and bristles white, upper occipitals black. Face at antennae 41/47 width of one eye, vertex 33. Antennae black, hairs white, segments measure 16-9-18-32.

Mesonotum black, grayish brown pollinose, broadly divided central stripe and intermediate spots brown. Hairs black, anteriorly shorter than antennae 2, a few white on humeri and all margins, long white posteriorly. Bristles mostly black, no anterior dorsocentral. Scutellum grayish white pollinose, hairs white and as long as antennae 1-2, 12 white marginal bristles.

Abdomen black, grayish white pollinose; hairs white, long parted apically on 2 and on 3, shorter on 4-5, very short on 6-7. Venter grayish white pollinose, hairs white, long on 1-4, short on 5-7 except apically on 7. Eight black, grayish pollinose, short hairs on tergite black and white; sternite produced and 1.3 times as long as sternite 7, hairs white basally, long black and quite dense apically. Terminalia black, hairs black, white at tip of surstyli and a few on sides; base of lower forceps white haired, fringe brown about 2/3 length of antennae 2.

Wings hyaline, veins brown, anterior crossvein at 36/70 length of discal cell, third vein branched at 15/34 distance from anterior to discal crossvein, stump 1/2 length of anterior crossvein.

FEMALE. Length 21 mm. Hairs and bristles of head all white. Mesonotal bristles white except 1 presutural on each side. White hairs on scutellum subequal in length to antennae 2; 7 white marginal bristles. Abdomen white pollinose, hairs short white, longer on sides of 1-2; 7 narrowly black dorsally with a few short black hairs. Venter grayish white pollinose, hairs white, sparse erect on 1-5, short on 6-7. Ovipositor black, 4.1 mm. long, at middle 1/6 as wide as long. Anterior crossvein at 40/72 length of discal cell, third vein branched at 15/32 distance from anterior to discal crossvein, stump 1/2 length of anterior crossvein.

***Efferia parkeri* Wilcox, new species.**

MALE. Length 16 mm. Head black; face white, frons yellowish gray, occiput grayish pollinose. Mystax white with 2 black bristles below on each side; hairs on frons black and white; 2 black bristles and several long black and white hairs on ocellar tubercle; upper occipitals black; beard, hairs on proboscis and below on palpi white, upper hairs on palpi black. Face at antennae 31/39 width of one eye, vertex 25. Antennae black, hairs white, segments measure 14-6-17-20.

Mesonotum black; brownish pollinose; humeri, lateral margins and suture grayish; central stripe black, divided anteriorly. Hairs black, anteriorly subequal in length to antennae 1; humeri and all margins white haired. Bristles black, 2 presutural, 2 supraalar, 2 postalar and 2 long black hairs, 7 posterior and 5 anterior dorsocentral. Pleura and coxae grayish pollinose, mesopleura golden, hairs white. Scutellum brownish pollinose; hairs white, dense and as long as antennae 1-2; 11 black marginal bristles and 3 long black hairs.

Abdomen black, segments 1-3 grayish and 4-7 white pollinose, dorsum 2-3 subshining black. Hairs white, long parted on 2-7 becoming shorter apically; 6 whitish lateral bristles on 1. Venter grayish white pollinose, hairs erect white becoming shorter apically. Eight hidden by 7. Terminalia yellowish red, surstyli brown basally; hairs white; fringe white and subequal in length to antennae 2.

Femora black, basal 4/5 of tibiae yellowish red, tips and the tarsi brown. Hairs white; bristles on fore tibiae and hind femora mostly black; otherwise mostly white. Claws black, base reddish; pulvilli and empodia light brownish.

Halteres brown, stem light brown. Wings hyaline, veins light to dark brown, anterior crossvein at 27/49 length of discal cell, third vein branched at 12/22 distance from anterior to discal crossvein, stump vein minute, anterior branch of third vein ends in second vein.

FEMALE. Length 13 mm. Hairs on frons mostly white and only 4-6 black occipital bristles. More white hairs anteriorly on mesonotum behind humeri and posteriorly in central row. Ten yellowish white scutellar bristles. Abdomen grayish pollinose, the dorsum appearing black at some angles; hairs white, longer on sides and posterior margins of 1-6. Venter grayish white pollinose, hairs erect white becoming shorter apically. Ovipositor black, 2.9 mm. long, at middle 1/5 as wide as long. Leg bristles mostly white, a row on fore tibiae and below on tarsi black. Anterior crossvein at 24/45 length of discal cell, third vein branched at 14/21 distance from anterior to discal crossvein, stump vein 2/3 length of anterior crossvein.

HOLOTYPE. Male, 8 mi. N. of Tucson, Arizona, 20 April 1962 (J. Wilcox), CAS.

ALLOTYPE. Female, same data, 17 April 1963 (Earl G. Davis).

PARATYPES. *Arizona*: 5 ♂♂, 9 ♀♀, same data, 10 March, 15-19 April 1963, 10-29 April 1964 (Earl G. Davis, J. Wilcox), JW; 1 ♀, Apache Junction, Pinal County, 16 March 1962 (Larry Gardner), ASU, 1 ♂, 1 ♀, 13 April 1964 (J. Wilcox), JW; 1 ♂, 2 ♀♀, Casa Grande, 29 March 1956 (A. F. Howland), JW; 1 ♀, Florence, 13 April 1964 (J. Wilcox), JW; ♂, Gila Bend, 25 April 1935 (F. H. Parker), JW; 3 ♂♂, 4 ♀♀, Granite Reef Dam, Maricopa County, 25 March, 3 May 1962, 17 April 1964 (J. M. Davidson, Tom Pollard, Jack Strong), ASU; 1 ♂, 3 ♀♀, Mineral Mountain, 18 mi. NE. of Florence, 26 April 1964 (Earl G. Davis), JW; 2 ♀♀, Phoenix, 15 April 1941 (J. Wilcox, Jr.), JW; 1 ♂, Redrock, April (D. K. Duncan), JW; 2 ♂♂, 2 ♀♀, Sacaton, 25 March 1956 (A. F. Howland), JW; 10 ♂♂, 10 ♀♀, Tempe, April (D. K. Duncan), JW; 2 ♂♂, Rillito, 20, 22 March 1934 (H. J. Basinger), CAS; 2 ♀♀, Sells, 26 April 1935 (F. H. Parker), JW; 2 ♂♂, 2 ♀♀, Tucson, 16 April 1941 (N. R. Anderson, J. Wilcox), JW; 1 ♂, 2.5 mi. E. of Verde River Bridge, Highway 57, 27 March 1963 (M. A. Cazier, M. Mortenson), ASU.

Named for Frank H. Parker, Globe, Arizona who has collected large numbers of Arizona Asilidae.

Efferia pilosa (Hine).

The male of this species traces to the Staminea Group while the female traces to the Pogonias Group. It has been included in the keys to both groups. References, descriptions, figures, and records are given in the section on the Pogonias Group.

Efferia plena (Hine).

Erax plenus HINE, 1916, Ohio Jour. Sci., vol. 17, p. 21. Types male and female, Douglas County, Kansas, 900 feet (F. H. Snow), OSU. Also, Onaga, Kansas, August 20, 1901 and Osborne County, Kansas, 1,557 feet, August 3, 1912 (F. X. Williams).

Erax plenus HINE, 1919, Ann. Entomol. Soc. Amer., vol. 12, p. 148. Description and figure of the male hypopygium; other localities; Ardmore, Indian Territory (C. R. Jones); Plano, Texas (Tucker); Waco, Texas (Belfrage), and other localities in Texas.

Bromley (1934) reports the following localities in *Texas*: Austin, May (U.T.), May 30; Brady, July (R. H. Painter); Dallas, AMNH; Waco, July 24, 1932 (S. W. Bromley); he says, "This large robust species appears to be rather uncommon. The only specimen I have seen was in a grassy area along a roadway. June to August."

Specimens are known from the following localities in *Texas*: Frisco, 12 July 1935; McLellan, 14 June 1934 (T. McGregor), 16 June 1933 (F. F. Bibby); Sabinal, 6 July 1934 (J. D. Beamer).

MALE. Length 29 mm. Head black, face and frons yellowish, occiput white pollinose. Hairs and bristles yellowish; 2 on ocellar tubercle and some hairs and occipital bristles, black. Face at antennae 60/62 width of one eye, vertex 50. Antennae brown, hairs yellow, segments measure 22-10-25-46.

Mesonotum black, humeri and postalar calli reddish; brown pollinose. Hairs black, anteriorly shorter than antennae 2, a few yellowish laterally behind suture. Bristles black, no anterior dorsocentral. Scutellum brown, hairs black subequal in length to antennae 1, 13 black marginal bristles.

Abdominal segments 1-3 brownish pollinose, 4-7 white; hairs white on 4-7, parted on 4; black on 1-3 with some longer yellowish laterally. Venter 1-4 yellowish brown pollinose, 5-7 whitish, 5-6 bare brown at middle; hairs erect white on 1-5, short on 6-7. Eight black, hairs yellowish, a few short black on tergite. Terminalia black, lower forceps above reddish brown; hairs yellowish, black dorsally on surstyli; fringe black, margined with yellow hairs and subequal in length to antennae 2.

Wings hyaline, veins light brown, anterior crossvein at 38/75 length of discal cell; third vein branched at 22/35 distance from anterior to discal crossvein, stump vein about as long as anterior crossvein.

FEMALE. Length 33 mm. Only upper occipital bristles black. Discal hairs on scutellum yellowish and in length shorter than antennae 2; 7 black marginal bristles. Abdomen yellowish pollinose, 7 brownish dorsally; hairs short yellowish, longer on sides of 1. Venter yellowish pollinose and yellowish haired, sparse long on 1-3. Ovipositor black, 5.6 mm. long, at middle 1/9 as wide as long.

Efferia prairiensis (Bromley).

Erax prairiensis BROMLEY, 1934, Ann. Entomol. Soc. Amer., vol. 27, p. 95. Types male and female, Prairie View, Texas, June 8, 1932 (S. W. Bromley), TAMU. Paratypes, same data and June 18, 1933 (H. J. Reinhard, R. K. Fletcher).

Specimens are known from the following localities. *Kansas*: Cherokee County, 888 feet, 1915 (R. H. Beamer); Osage County, 888 feet, 1915, 16 June 1933 (R. H. Beamer). *Oklahoma*: Quinton, 12 June 1934 (A. E. Pritchard); Tuskahoma, 14 June 1934 (A. E. Pritchard). *Texas*: Paris, 18 June 1935; Prairie View, 8, 18 June 1932 (S. W. Bromley, H. J. Reinhard).

MALE. Length 20 mm. Head black; face and frons yellowish, occiput grayish white pollinose. Hairs and bristles yellow; hairs on frons mostly, 7 bristles and several hairs on ocellar tubercle, and upper occipitals black. Face at antennae 46/42 width of one eye, vertex 40. Antennae brown; hairs yellowish, 1 black above on segment 1, and 2 on 2; segments measure 15-9-20-28.

Mesonotum black, yellowish pollinose, central stripe and intermediate spots brown. Hairs black, anteriorly subequal in length to antennae 1, in

part on humeri and on margins yellowish. Bristles mostly black, no anterior dorsocentral. Scutellum yellowish pollinose, hairs yellowish and as long as antennae 1-2, 5 black and 1 yellowish marginal bristles.

Abdomen black, segments 1 and sides of 2-6 yellowish pollinose, 7 white, dorsum 2-6 brown. Hairs short yellowish, longer on sides of 1-3, white on 7. Venter yellowish pollinose basally becoming white apically; hairs long yellowish on 1-3, shorter erect white on 4-5, short white on 6-7. Eight brown, hairs yellowish, a few black on tergite. Terminalia black, lower margin of surstyli brown; hairs yellowish, black dorsally on surstyli and a few on ventral margin; fringe black margined with yellow, subequal in length to antennae 1 becoming shorter apically.

Wings hyaline, slightly reddish apically; veins light brown, anterior crossvein at $21/49$ length of discal cell, third vein branched at $14/28$ distance from anterior to discal crossvein, stump vein subequal in length to anterior crossvein.

FEMALE. Length 23 mm. Anterior mesonotal hairs shorter than antennae 2. Discal hairs of scutellum mostly black and subequal in length to antennae 2, 3 black and 6 yellowish marginal bristles. Abdomen yellowish gray pollinose, dorsum narrowly brownish; short hairs yellowish white, longer on sides of 1, short black dorsally on 7. Venter grayish pollinose, hairs white, longer on 1-3. Ovipositor black, 4.4 mm. long, at middle $1/6$ as wide as long. Anterior crossvein at $30/65$ length of discal cell, third vein branched at $20/35$ distance from anterior to discal crossvein.

Efferia rapax (Osten Sacken).

Erax rapax OSTEN SACKEN, 1887, Biologia Centrali-Amer. Insecta. Diptera, vol. 1, p. 201.

Types, male and female, northern Sonora, Mexico (Morrison), BMNH.

Erax rapax, HINE, 1911, Ohio Nat., vol. 11, p. 307. Description, reports from Colorado and New Mexico.

Erax rapax, HINE, 1919, Ann. Entomol. Soc. Amer., vol. 12, p. 142. Description and figure of male hypopygium; says, "Common in southwestern United States and Mexico."

James (1941) reports this species from *Colorado*: Boulder; Left Hand Canyon, near Jamestown; White Rocks, near Valmont; Owen's Lake, near Valmont; Horsetooth Mountain, Larimer County; Virginia Dale; Masonville; Home; Ft. Collins; Inspiration Point; Denver; La Porte; Custer County; Saguache; Lonetree; Hesperus; Rockwood, La Plata County. Late June to September. Says, "Replaces *stamineus* at lower elevations in July and August. Common in grassland, near foothills and mountains."

Specimens are known from the following localities. *Arizona*: Apache, Cochise, Coconino, Gila, Navajo, Pima, Pinal, Santa Cruz, and Yavapai counties; August and September. *New Mexico*: Grant and Valencia counties, September.

MALE. Length 22 mm. Head black, face and frons yellowish; occiput white pollinose. Hairs and bristles yellowish, beard lighter; hairs on frons mostly, 2 bristles and hairs on ocellar tubercle, and upper occipitals, black. Face at antennae 42/52 width of one eye, vertex 30. Antennae black, hairs yellow, segments measure 15-9-22-32.

Mesonotum black, grayish brown pollinose, central stripe and intermediate spots brown. Hairs black, anteriorly subequal in length to antennae 2, a few yellowish laterally behind suture. Bristles black, 6-7 weak anterior dorsocentral. Scutellum yellowish gray, hairs black and subequal in length to antennae 1, 8 black marginal bristles and some longer black hairs.

Abdomen black, segment 1 and sides of 2 grayish, sides and posterior margin of 3 and all of 4-7 white pollinose; dorsum of 2 and 3 basally black. Hairs on 1-2 and base of 3 black or yellowish, 3 apically and 4-5 with white parted hairs, short parted on 6 and very short on 7; 5 yellow lateral bristles on 1. Venter yellowish gray pollinose basally becoming gray apically, hairs yellowish, erect on 1-5, short on 6-7. Eight brown, hairs on sternite yellow, on tergite yellow and black. Terminalia black, ventral apical margin of surstyli brownish red; hairs yellowish, dorsum of surstyli with black hairs and 6-8 long black hairs on ventral margin; fringe brown, margined with yellow and a few longer black hairs, subequal in length to antennae 1.

Wings hyaline, veins brown, anterior crossvein at 35/68 length of discal cell, third vein branched at 9/33 distance from anterior to discal crossvein, stump 1/2 length of anterior crossvein.

FEMALE. Length 22 mm. Hairs and bristles of head yellowish white except 1 black on ocellar tubercle. Mesonotal bristles yellowish and humeri and margins in part yellowish haired. Scutellar hairs yellowish and subequal in length to antennae 2, 8 yellowish marginal bristles. Abdominal segment 1 and broad sides of 2-7 grayish pollinose, dorsum of 2-7 yellowish; hairs short yellowish, slightly longer on sides of 1-2. Venter yellowish gray pollinose, hairs white, erect on 1-4. Ovipositor black, tapering from base to middle, 4.4 mm. long, at middle 1/7 as wide as long.

Efferia staminea (Williston).

Erax stamineus WILLISTON, 1885, Trans. Amer. Entomol. Soc., vol. 12, p. 68. Type male, Montana (Professor Comstock), UK.

Erax stramineus, HINE, 1919, Ann. Entomol. Soc. Amer., vol. 12, p. 140. Description and figures of wing and male hypopygium; reports from Montana and Wyoming.

Erax tanneri BROMLEY, 1937, Utah Acad. Sci., Arts, and Letters, vol. 14, p. 105, figure of male genitalia. New synonymy. Type male, Buena Vista, Colorado, 7,800 feet, August 1932 (C. Lynn Hayward), BYU.

James (1941) corrects Hine's spelling and reports this species from the following localities in *Colorado*: Boulder; Owen's Lake, near Valmont; White

Rocks, near Valmont; Ft. Collins; Horsetooth Mountain, Larimer County; College Pasture, Ft. Collins; Inspiration Point, Denver; Home; Virginia Dale; Evergreen; La Porte. He says, "Common in grassland near foothills. June to August at lower, August to September at higher elevations."

Specimens are known from the following localities. *Colorado*: Boulder and 6 mi. N., 20, 29 June, 20 July 1933 (H. and M. T. James); Jimtown, 7 August 1932 (M. T. James); Manitou, 19 June 1926 (E. C. Van Dyke); White Rocks, Valmont, 2, 4 July 1933 (M. and H. James). *Montana*: Bridger Mountains, 5,500 feet, 10 August 1915; Gallatin County, 27 June 1928, 16, 30 July 1924, E-28, 831; Meagher County, 22 August 1917.

MALE. Length 18 mm. Head black, face and frons yellowish white, occiput grayish pollinose. Hairs and bristles yellowish; shorter hairs on sides of frons, the 2 weaker bristles on the ocellar tubercle, and the upper occipitals black. Face at antennae $36/42$ width of one eye, vertex 29. Antennae black, hairs yellow, segments measure 15-8-19-25.

Mesonotum black, yellowish brown pollinose, divided central stripe and intermediate spots brown. Hairs black, anteriorly subequal in length to antennae 1 and at suture subequal to antennae 1-2, a few yellowish laterally behind suture. Bristles black, no anterior dorsocentral. Scutellum yellowish gray pollinose, hairs black and subequal in length to antennae 1, 6 black and 4 yellowish marginal bristles.

Abdomen black, segments 1-2 gray laterally and brown dorsally, 3-7 white; hairs on 1-2 yellowish with a few black, 2 apically and 3-6 with long white parted hair becoming shorter apically, 7 short white haired. Venter brownish pollinose basally becoming gray apically, hairs white, erect on 1-4. Eight brown, hairs yellowish. Terminalia black; hairs yellowish, black dorsally on surstyli and about 12 black on ventral margin; fringe brown margined with sparse yellow hairs, at base dense and subequal in length to antennae 1-2, apically subequal in length to antennae 2.

Wings hyaline, veins light brown, anterior crossvein at $26/54$ length of discal cell, third vein branched at $10/28$ distance from anterior to discal crossvein, stump subequal in length to anterior crossvein.

FEMALE. Length 21 mm. Hairs and bristles of head all yellowish, beard white. Mesonotal bristles yellowish white. Scutellar hairs white, a few black, subequal in length to antennae 2; 10 yellowish white marginal bristles. Abdomen grayish pollinose, dorsum 2-7 brownish; hairs short white, longer on sides 1-2. Venter yellowish gray pollinose, hairs erect white becoming shorter apically. Ovipositor black, tapering on basal $1/3$, 4.7 mm. long, at middle $1/8$ as wide as long. Anterior crossvein at $31/62$ length of discal cell, third vein branched at $15/31$ distance from anterior to discal crossvein, stump longer than anterior crossvein.

***Efferia texana* (Banks).**

Erax texanus BANKS (in Hine), 1919, Ann. Entomol. Soc. Amer., vol. 12, p. 151, figure of male hypopygium. Type male, Texas (Lafr.), MCZ.

Bromley (1934) reports from the following counties in *Texas*: Bexar, Brooks, Dimmit, Eastland, Frio, Hidalgo, Jim Hogg, Kendall, Kimble, La Salle, Pecos, Starr, Uvalde, and Webb; July 18–August 18.

Specimens are known from the following localities. *Arizona*: 2 mi. NE. of Portal, 23 August 1960 (M. A. Cazier). *Oklahoma*: Murray County, 22 August 1933 (A. E. Pritchard); Wichita National Forest, 27 June 1936 (M. B. Jackson). *Texas*: Bosque County, 18 June 1933 (F. F. Bibby); Concan, 6 July 1936 (J. D. Beamer); Dimmit County, 26 June 1933 (S. E. Jones); Gatesville, 16 August 1935; George West, 4 July 1936 (M. B. Jackson); Hebbbronville, 18 August 1932 (S. E. McGregor); Johnson County, 1 July 1934; Pearsall, 13 August 1932, 14 August 1933 (S. E. McGregor); Sabinal, 6 July 1936 (J. D. Beamer); Taylor, 19 September 1935; Uvalde, 6, 11 August 1933, 14 September 1932 (S. E. McGregor); Weslaco, 25 June 1933 (S. W. Bromley).

MALE. Length 22 mm. Head black; face yellowish white, frons yellowish, occiput grayish white pollinose. Bristles of mystax yellowish, hairs white; frons black haired with a few white to sides of antennae; 2 black bristles and several black hairs on ocellar tubercle; upper occipitals black, yellow below; beard, hairs on proboscis and a few on palpi white, palpi largely black haired with several strong yellowish apically. Face at antennae 50/55 width of one eye, vertex 42. Antennae black; hairs white, mostly black above on 1; segments measure 18-10-19-33.

Mesonotum black, humeri and postalar calli reddish; brown pollinose, divided central stripe and intermediate spots darker, a touch of gray inside humeri and laterally behind suture. Hairs black, anteriorly shorter than antennae 2, a few white laterally behind suture. Bristles black, no anterior dorsocentral. Scutellum brown pollinose, hairs black and subequal in length to antennae 1; 8 black marginal bristles.

Abdomen black, grayish white pollinose, dorsum 2-5 broadly subshining brownish black. Hairs short white, parted apically on 2 and on 3, long on sides of 1; short black dorsally on 1-6. Venter grayish pollinose, hairs erect white becoming shorter apically. Eight black, hairs white, sternite produced and 2 times length of sternite 7, apically with a few black hairs. Terminalia black, hairs black, yellowish at apex of surstyli and on sides and basally on lower forceps; fringe brown and subequal in length to antennae 2.

Wings hyaline, veins brown, anterior crossvein at 50/86 length of discal cell, third vein branched at 14/36 distance from anterior to discal crossvein, stump as long as anterior crossvein.

FEMALE. Length 28 mm. Hairs on antennae white. Scutellar hairs mostly white, partly black; 8 black marginal bristles. Abdomen grayish white pollinose, dorsum 2-7 subshining brown; hairs white, longer on sides of 1-2, dorsum 1-7 with short black hairs, 6-7 largely. Venter grayish pollinose, 1-5 erect white haired, 6-7 mostly short black haired. Ovipositor black, 5.9 mm. long, at middle $1/8$ as wide as long. Anterior crossvein at $43/83$ length of discal cell, third vein branched at $16/40$ distance from anterior to discal crossvein.

***Efferia truncata* (Hine).**

Erax truncatus HINE, 1911, Ohio Nat., vol. 11, p. 309. Types male and female, Huachuca Mountains, Arizona, July 28, 1907, OSU.

Erax truncatus HINE, 1919, Ann. Entomol. Soc. Amer., vol. 12, p. 143. Description and figure of male hypopygium.

Specimens from the following localities. *Arizona*: Baboquivari Mountains (F. H. Snow); Canyon Lake, 21 August 1933 (F. H. Parker); Gila Valley, Graham County, August (D. K. Duncan); Globe, September (D. K. Duncan); Mt. Graham, July (D. K. Duncan); Pepper Sauce Canyon, Oracle, 14 August 1948 (J. Wilcox); Pinal Mountains, 4 August 1933 (F. H. Parker); San Carlos Lake, September (D. K. Duncan); Santa Rita Mountains, June (D. K. Duncan); Willcox, 20 June 1932 (D. K. Duncan). *Colorado*: Mesa Verde, 6,599 feet, 22 July 1937 (G. P. Engelhardt).

MALE. Length 21 mm. Head black, white pollinose, frons yellowish. Mystax white, bristles yellowish; frons white and black haired; 2 black and 2 white bristles on ocellar tubercle; upper 6-8 occipital bristles black, others yellowish; beard, hairs on proboscis and below on palpi white, above on palpi black. Face at antennae $39/44$ width of one eye, vertex 33. Antennae black, hairs white, segments measure 15-8-17-30.

Mesonotum black, humeri and postalar calli reddish; grayish golden pollinose, divided central stripe and intermediate spots brown. Hairs black, anteriorly shorter than antennae 2, a few white on humeri and lateral margins. Bristles black, no anterior dorsocentral. Scutellum brownish pollinose, hairs mostly black and subequal in length to antennae 1; 6 black marginal bristles.

Abdomen black, white pollinose, hairs white, parted on 2-4, short on 5-7, a few black on 1. Venter gray, hairs white, long erect on 1-4. Eight brown, grayish pollinose, hairs white. Terminalia reddish brown; hairs white, black dorsally on surstyli and a few laterally; fringe brown to yellowish, sparse and subequal in length to antennae 2.

Wings hyaline, veins brown, anterior crossvein at $45/76$ length of discal cell, third vein branched at $14/31$ distance from anterior to discal crossvein, stump as long as anterior crossvein.

FEMALE. Length 26 mm. Palpi white haired. Scutellar hairs white and subequal in length to antennae 2; 6 black marginal bristles. Abdomen gray

pollinose, dorsum 6-7 brownish; hairs short white, longer on sides 1-2, dorsum 6-7 short black. Venter gray pollinose, hairs white, long erect on 1-4. Ovipositor brownish black with a wedge shaped projection at base of sternite 8, 6.9 mm. long, at middle $1/8$ as wide as long.

Efferia varipes (Williston).

Erax varipes WILLISTON, 1885, Trans. Amer. Entomol. Soc., vol. 12, p. 71. Type male, Arizona (Prof. Comstock), Western Kansas (Guild), UK.

Erax varipes HINE, 1919, Ann. Entomol. Soc. Amer., vol. 12, p. 152. Description male and female, figure male hypopygium.

James (1941) records from *Colorado*: Las Animas, June 21, 1931 (Leonard Sweetman); Burlington, July 27, 1933 (Rodeck and James); Crystal Springs Country Club, Flagler, July 25, 1933 (Rodeck and James); Manitou, August 6, 1905; Boulder, July 17, 1934 (Ed. C. Smith).

Specimens from the following localities. *Arizona*: Chiricahua Mountains, August (D. K. Duncan); Showlow, 16 July 1932 (D. K. Duncan); Sierra Ancha Mountains, July (D. K. Duncan); Sonoita, 30 June 1949 (J. Wilcox); Willcox, 27 June 1949 (J. Wilcox). *Colorado*: Las Animas, 21 June, 12, 13 July 1931. *New Mexico*: 25 mi. N. of Las Vegas, 6,650 feet, 28 June 1931 (H. A. Scullen); 15 mi. E. of Santa Fe, 7,100 feet, 27 June 1931 (H. A. Scullen); Silver City, 24 June, 14 July 1933, 1 July 1932, 6 July 1934 (R. T. Kellogg), 22 July 1936 (J. D. Beamer, M. B. Jackson); Torrance County, July 1925 (C. H. Martin).

MALE. Length 24 mm. Head black (face reddish laterally), whitish pollinose, hairs and bristles all white. Face at antennae $46/48$ width of one eye, vertex 38. Antennae black, segment 2 reddish, hairs white, segments measure 18-9-18-37.

Mesonotum black, humeri and postalar calli reddish; yellowish gray pollinose, divided central stripe and intermediate spots brown. Hairs black, anteriorly shorter than antennae 2, humeri and broad margins short yellowish haired. Bristles yellowish, 2 weak black anterior dorsocentral. Ground color of pleura and coxae largely red, yellowish white pollinose, hairs and bristles white. Scutellum black, yellowish gray pollinose, hairs white and a little longer than antennae 2; 12 whitish marginal bristles and several long hairs.

Abdomen white pollinose, dorsum 1-6 brown; hairs white, long on the sides and apically on 1-3 but coarse and sparse. Venter brown basally, reddish apically; white pollinose with narrow bare streak at middle of 2-6; hairs short white. Eight reddish, grayish pollinose, hairs yellowish, several black on tergite. Terminalia yellowish red; hairs yellowish white, black dorsally on surstyli; fringe black to brown and margined with whitish hairs basally, subequal in length to antennae 1-2, shorter at apex.

Wings hyaline, veins reddish brown, anterior crossvein at 38/78 length of discal cell, third vein branched at 16/40 distance from anterior to discal crossvein, stump a little shorter than anterior crossvein.

FEMALE. Length 24 mm. Mesonotal bristles all white. Scutellar hairs all white and shorter than antennae 2. Abdomen grayish pollinose, dorsum 2-7 brownish; hairs short white, slightly longer on 1 and on sides of 2-3, several black at apex of 7 dorsally. Venter grayish white pollinose, narrowly brown at middle of 2-7; hairs short white. Ovipositor black, dark reddish basally, 4.7 mm. long, at middle 1/4 as wide as long.

***Efferia wilcoxi* (Bromley).**

Erax wilcoxi BROMLEY, 1940, Bull. Brooklyn Entomol. Soc., vol. 35, p. 16. Figure of male genitalia. Type male, Uvalde, Texas, June 15, 1930 (J. O. Martin), CAS.

Specimens from the following localities. *Arizona*: Cochise County, 5 mi. S. of Junction of Highways 181 and 186, 29 May 1961 (M. A. Cazier, M. A. Mortenson, M. Statham); 2 mi. NE. of Portal, 29, 30 May 1962 (M. A. Cazier, J. Wilcox). *New Mexico*: 2 mi. N. of Rodeo, Hidalgo County, 17 June 1955 (M. Statham); Silver City, 17 June 1933 (R. T. Kellogg).

FEMALE. Length 12 mm. Head black, white pollinose, hairs and bristles white. Face at antennae 22/29 width of one eye, vertex 18. Antennae black, hairs white, segments measure 8-4-10-17.

Mesonotum black, yellowish white pollinose, central stripe and intermediate spots brown. Hairs black, anteriorly subequal in length to antennae 1, humeri and broad margins white haired. Bristles white, 3 weak anterior dorsocentral. Pleura and coxae grayish white pollinose, hairs and bristles white. Scutellum grayish white pollinose, hairs white and subequal in length to antennae 1, 6 white marginal bristles and several longer hairs.

Abdomen grayish pollinose, dorsum 2-7 brownish; hairs short white, longer on sides 1-2. Venter grayish pollinose, hairs short white, longer on 1-2. Ovipositor brown, reddish basally, 2.1 mm. long, at middle 1/4 as wide as long.

Femora black, tibiae and tarsi reddish. Hairs white; a few above at apex of fore femora, below on hind tibiae and above on hind tarsi, black. Bristles white, black at tips of tibiae and in part on tarsi especially the hind ones. Claws black, base reddish; pulvilli yellowish; empodia white.

Halteres yellowish, stem white, base brown. Wings hyaline, veins brown, anterior crossvein at 17/35 length of discal cell, third vein branched at 16/18 distance from anterior to discal crossvein, stump minute, anterior branch of third vein ends in the second vein.

MALE. Length 10 mm. Hairs on palpi largely black. Dorsocentral bristles black. Abdomen grayish white pollinose, dorsum 2-6 brown; hairs short white, longer on sides of 1-2. Venter grayish pollinose, hairs white, long on

1-3. Terminalia yellowish red; hairs white, dorsum of surstyli and sides sparsely black haired; fringe white, sparse, as long as antennae 1. Anterior crossvein at $17/32$ length of discal cell, third vein branched opposite discal crossvein, anterior branch of third vein ends in costa in some specimens, no stump vein.

Efferia yermo Wilcox, new species.

MALE. Length 16 mm. Head black, whitish pollinose, somewhat thin on frons. Hairs and bristles white; 2 bristles and 4-5 hairs on ocellar tubercle, black, 1 bristle and 6-7 hairs white; 7-8 black occipital bristles. Face at antennae $32/40$ width of one eye, vertex 29. Antennae black, hairs white, segments measure 10-6-11-26.

Mesonotum black, gray pollinose, broadly divided central stripe and intermediate spots indistinctly black. Hairs black, anteriorly subequal in length of antennae 1; in part on humeri and all margins white. Bristles white, 2 presutural, 2 supraalar, 2 postalar, 5-6 weaker dorsocentral. Pleura and coxae thinly grayish pollinose, hairs and bristles white. Scutellum gray pollinose, hairs erect white and as long as antennae 1-3; 12 slender white marginal bristles.

Abdomen black; white pollinose, thin on 2; hairs white, parted on 2-7. Venter gray pollinose; hairs white, long erect on 1-2. Eight black, gray pollinose, hairs white. Terminalia black; hairs white, a few black above basally on surstyli; surstyli in dorsal view apically $1\frac{1}{3}$ times as wide as at base, in lateral view widened apically and the apical margin concave; fringe white, basally subequal in length to antennae 1-2, apically subequal to antennae 1.

Legs black, basal $1/2$ of tibiae reddish. Hairs and bristles white, a few short black below on tarsi. Claws black, base reddish; pulvilli and empodia light brown.

Halteres dark brown. Wings hyaline, veins brown, anterior crossvein at $30/52$ length of discal cell, third vein branched at $18/22$ distance from anterior to discal crossvein, stump vein subequal in length to anterior crossvein, anterior branch of third vein ends at junction of costa and second vein.

FEMALE. Length 20 mm. Hairs and bristles of head all white. Abdomen black; grayish white pollinose, dorsum of 7 shining black; hairs white, long on 1-3, more or less parted on 2-3; short black dorsally on 7. Venter gray pollinose; hairs white, erect on 1-3. Ovipositor black, 5.4 mm. long, at middle $1/10$ as wide as long, narrow on apical $2/3$. Tibiae and tarsi reddish.

HOLOTYPE. Male, Yermo, San Bernardino County, California, 28 April 1949 (E. G. Linsley, J. W. MacSwain, R. F. Smith), CIS.

ALLOTYPE. Female, same data.

PARATYPES. *California*: 3 ♀♀, 5 mi. N. of Baker, San Bernardino County, 29 March 1953 (J. W. MacSwain), CIS; 2 ♀♀, Cronise, 29 April 1953 (P. H.

Timberlake), UCR; 1 ♀, Ludlow, San Bernardino County, 11 April 1952 (E. E. Gilbert), CIS; 1 ♀, Mojave, 12 May 1940, JW.

Efferia yuma Wilcox, new species.

MALE. Length 15 mm. Head black, white pollinose, on frons rather thin. Hairs white; 1 bristle on ocellar tubercle and 5 hairs brown. Face at antennae 30/48 width of one eye, vertex 25. Antennae black, hairs white, segments measure 14-6-12-22.

Mesonotum black, grayish pollinose, divided central stripe and intermediate spots brown. Hairs on central stripe black and subequal in length to antennae 2, on intermediate spots black; otherwise white. Bristles white, 2 presutural, 2 supraalar, 3 postalar, 5 weaker posterior and 4-5 black anterior dorsocentral. Pleura and coxae thinly grayish pollinose, hairs and bristles white. Scutellum gray pollinose, hairs white as long as antennae 1-3; 12 white marginal bristles.

Abdomen black, grayish white pollinose; hairs white, long parted on 2-7. Venter grayish white pollinose, hairs erect white on 1-5, semierect on 6-7. Eight brown, hairs white. Terminalia brown, surstyli reddish ventrally; hairs white; fringe sparse white, basally subequal to antennae 1 and apically to antennae 2.

Femora black, tibiae and tarsi yellowish red, tips of tibiae brown. Hairs and bristles white, a few short black below on tarsi. Claws black, base reddish; empodia light brown; pulvilli yellowish.

Halteres brown, stem light brown. Wings hyaline, veins brown, anterior crossvein at 30/50 length of discal cell, third vein branched at 17/20 distance from anterior to discal crossvein, stump vein 2/3 length of anterior crossvein, anterior branch of the third vein ends in the second vein.

FEMALE. Length 16 mm. Two bristles on ocellar tubercle white, 2 long and 3 shorter hairs black; 1-3 black occipitals. Anterior intermediate mesonotal spots white haired and 2-4 of anterior dorsocentral bristles white. Abdomen grayish white pollinose, narrow dorsum 6-7 shining black; hairs white, long on sides and posterior margins, more or less parted on 2-4. Venter grayish white pollinose, hairs erect white but shorter on apical segments. Ovipositor brownish black, 3.1 mm. long, at middle 1/5 as wide as long. Anterior crossvein at 29/48 length of discal cell, third vein branched at 12/19 distance from anterior to discal crossvein, stump subequal in length of anterior crossvein, anterior branch of third vein ends at junction of costa and second vein.

HOLOTYPE. Male, 16 mi. E. of Yuma, Arizona, 17 April 1941 (Itol, and J. Wilcox).

ALLOTYPE. Female, same data (J. Wilcox).

PARATYPES. *Arizona*: 10 ♂♂, 50 ♀♀, same data and 8, 9 April 1964 (N. R. Anderson, Itol J., J. Jr. and J. Wilcox), JW; 8 ♂♂, 29 ♀♀, Aztec.

14 April 1964, 16 April 1941, 30 April 1962 (N. R. Anderson, Itol J., J. Jr., and J. Wilcox), JW. *California*: 1 ♂, 1 ♀, Kane Springs and 5 mi. N., Imperial County, 9, 12 April 1952 (E. G. Linsley, J. W. MacSwain), CIS; 1 ♂, 2 ♀♀, Glamis, Imperial County, 8 April 1964 (R. M. Bohart), UCD; 17 ♂♂, 25 ♀♀, 21, 22 mi. S. of Oasis, 30 March, 20 April 1941 (N. R. Anderson, Itol J., J. Jr. and J. Wilcox), JW; 2 ♂♂, Yuhu Plain, Imperial County, 17 April 1941 (J. Jr. and J. Wilcox), JW.

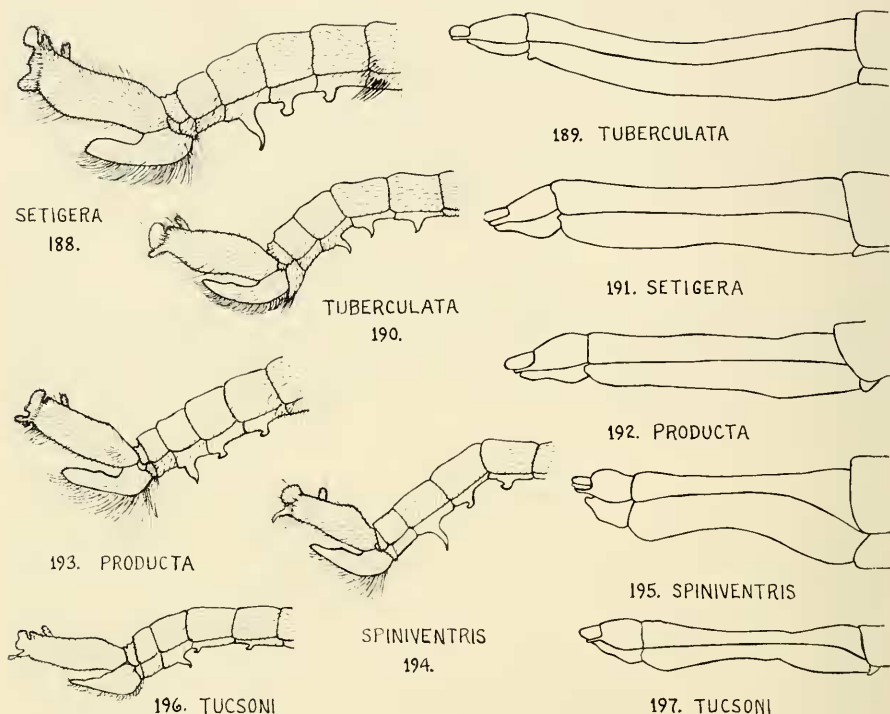
TUBERCULATA GROUP

Hine (1919) says, "The males of this group are at once known by the presence of a tooth-like prominence on the venter of each of abdominal segments four, five and six, and costa entirely normal. Branching of the third vein distinctly beyond the base of the second posterior cell. The species are slender and of rather small size."

The tubercles on the venter of the abdomen are usually blunt on segments 4 and 5 and pointed on 6; *E. tuberculata* (Coquillett) has the tubercles pointed on all three segments. The females have no distinct characters which will separate them from the females of the smaller species in the Albibarbis Group. Most of the specimens in the Albibarbis Group have short, sparse, strong bristles in the upper part of the mystax which are never found in the females of the Tuberculata Group but are not always found in the Albibarbis Group. The females of *E. wilcoxi* (Bromley) in the Staminea Group can also be confused with females of this group, as the furcation of the third vein is opposite the end of the discal cell (base of the second posterior cell). The wings of most males and some females have the costa slightly dilated and the subcostal cell is tinged light brown opposite the discal cell.

KEY TO THE SPECIES OF THE TUBERCULATA GROUP—MALES

1. Abdominal sternite 8 produced and as long or longer than sternite 7; tubercles all acute at apex; length 14-21 mm. (Arizona, New Mexico, Oklahoma, Texas) *E. tuberculata* (Coquillett)
- Sternite 8 shorter than 7; tubercles on sternites 4-5 obtuse or divided apically 2
2. Terminalia and tubercles black 3
- Terminalia and tubercles reddish 4
3. Mystax with many black bristles; 8 black scutellar bristles; abdominal segment 3 with a brush of black bristles apically on both the tergite and sternite; length 16-24 mm. (California) *E. setigera*, new species
- Mystax white; 4 white scutellar bristles; no black bristles on the abdomen; length 15-17 mm. (Arizona, California) *E. producta* (Hine)
4. Palpi black haired; lower forceps about half the length of the surstyli, ventral fringe short and of uniform width; length 11-15 mm. (Arizona, California, New Mexico)
- *E. tucsoni*, new species
- Palpi white haired; lower forceps about 3/4 length of surstyli, ventral fringe broad basally and narrowing to apex; length 12-15 mm. (Arizona, New Mexico)
- *E. spiniventris* (Hine)



FIGURES 188-197. Tuberculata Group, lateral view of the male terminalia and abdominal segments 3-7 (3 in part) and ovipositor of the *Efferia* species.

188. *E. setigera*, new species, male abdomen and terminalia.

189. *E. tuberculata* (Coquillett), ovipositor.

190. *E. tuberculata* (Coquillett), male abdomen and terminalia.

191. *E. setigera*, new species, ovipositor.

192. *E. producta* (Hine), ovipositor.

193. *E. producta* (Hine), male abdomen and terminalia.

194. *E. spiniventris* (Hine), male abdomen and terminalia.

195. *E. spiniventris* (Hine), ovipositor.

196. *E. tucsoni*, new species, male abdomen and terminalia.

197. *E. tucsoni*, new species, ovipositor.

KEY TO THE SPECIES OF THE TUBERCULATA GROUP—FEMALES

1. Hairs on the palpi usually all white; ovipositor short and broad, 2.8 mm. long, at middle 1/4 as long as broad *E. spiniventris*
Hairs on the palpi largely black; ovipositor longer and narrower 2
2. Mystax with many black bristles above; 2 black scutellar bristles; ovipositor 4.1 mm. long, at middle 1/7 as wide as long *E. setigera*
Mystax white, sometimes a few black bristles above, or below laterally; scutellar bristles white 3

3. Anterior mesonotal hairs subequal in length to antennal segment 1, 2-4 black anterior dorsocentral bristles; ovipositor 3.0-3.9 mm. long, at middle 1/6 as wide as long *E. producta*
 Anterior mesonotal hairs subequal in length to antennal segment 2; no black anterior dorsocentral bristles 4
4. Ovipositor reddish basally, constricted at basal 1/3; no black hairs on venter of abdomen; ovipositor 3.6 mm. long, at middle 1/7 as wide as long *E. tucsoni*
 Ovipositor black, not constricted basally but frequently twisted, 3.8 to 4.7 mm. long, at middle 1/8 as wide as long; sternite 7 apically with black hairs *E. tuberculata*

Efferia producta (Hine).

Erax productus HINE, 1919, Ann. Entomol. Soc. Amer., vol. 12, p. 136. Types male and female, Flinn Springs, Lakeside, California, August 9, 1917 (E. G. Holt), OSU. Other specimens from Spring Valley and Poway, August 10 and 14 (E. G. Holt).

The above localities are all in San Diego County, California.

Specimens from the following localities. *Arizona*: Globe, September (D. K. Duncan); Kingman, 2,450 feet, 22 June 1931 (Don Prentiss); Oracle Junction, 14 August 1948 (J. Wilcox); Pinal Mountains, July (D. K. Duncan), base of, 4,000 feet, August (D. K. Duncan); Roosevelt Lake, 21 August 1933 (F. H. Parker) 51; Sabino Canyon, 12 July 1932 (R. H. Beamer); San Xavier Mission, June (D. K. Duncan); Santa Catalina Mountains, 30 June 1933 (Owen Bryant) 276; Sedona, 2 July 1949 (J. Wilcox); 14 mi. NE. of Sells, 16 July 1962 (J. Wilcox); Tucson, 1 August 1937 (Owen Bryant). *California*: 13 mi. W. of Barstow, 21 June 1942 (Guy F. Toland, J. Wilcox); Cathedral City, 3 July 1951 (J. W. MacSwain, R. F. Smith); Deep Canyon, 7 July 1964 (E. I. Schlinger); 3 mi. S. of Kramer Junction, 8 June 1961 (R. M. Bohart), 15 mi. E., 6 July 1951 (J. W. MacSwain, R. F. Smith); Mojave, 8 June 1946 (W. F. Barr); Pinyon Flat, 24 May 1939 (E. G. Linsley); Sentenec Canyon, 15 June 1954 (J. Powell); Yermo, 31 May 1941 (J. Wilcox).

MALE. Length 15 mm. Head white pollinose; hairs white, 10 below on either side of mystax, 2 on ocellar tubercle and on palpi mostly, black. Face at antennae 27/39 width of one eye, vertex 20. Antennae black, gray pollinose, hairs white, segments measure 10-5-11-22.

Anterior mesonotal hairs subequal in length to antennal segment 1, 2-3 black anterior dorsocentral bristles. Scutellum gray pollinose, 4 white marginal bristles, discal hairs white and longer than antennal segments 1-2.

Abdomen black, grayish white pollinose, hairs white, longer on sides of segments 1-3. Venter gray pollinose, brown spot on 4-6; hairs white, long erect on 1-3; tubercles black, blunt on 4-5 and shorter than antennal segment 1, pointed on 6 and slightly longer than antennae 1. Terminalia brownish black, hairs white; fringe white, longer than antennal segments 1-2.

Wings hyaline, veins brown, anterior crossvein at 31/44 length of discal

cell, stump $1/3$ length of anterior crossvein, costa slightly dilated, subcostal cell light brown.

FEMALE. Length 17 mm. Abdomen gray pollinose, dorsum of segments 2-6 brown, 7 black; hairs white, longer on 1-2, dorsum 6-7 black haired; venter gray pollinose, 4-5 narrowly bare at middle, 6-7 largely bare, hairs erect white on 1-7; ovipositor black, 3.9 mm. long, at middle $1/6$ as wide as long.

See note under *E. setigera*.

Efferia setigera Wilcox, new species.

MALE. Length 24 mm. Head black, whitish pollinose, gibbosity and frons subshining. Mystax black and white, about 30 slender black bristles above; face at antennae $36/50$ width of one eye, vertex 25; hairs on frons half black and white; 2 black bristles and 6 long black hairs on ocellar tubercle; 4-5 upper occipital bristles and most of hairs on palpi black; beard and hairs on proboscis and upper occiput white. Antennae black, whitish pollinose, hairs white, 1 black hair below on segment 1, segments measure 14-7-15-30.

Mesonotum black, gray pollinose, broad central stripe black and divided anteriorly, intermediate spots subshining black. Anterior hairs black, quite dense and as long as antennal segment 1, hairs on humeri and margins white. Bristles black, 2 presutural, 1-2 supraalar, 2 postalar, 7 posterior and 3-4 weaker anterior dorsocentral. Pleura and coxae grayish pollinose, hairs white, a few on sterno- and mesopleura and hypopleurals black. Scutellum grayish pollinose, hairs white and as long as antennal segments 1-2, 8 black marginal bristles.

Abdomen grayish white pollinose, dorsum 2-5 brown, 6-7 narrowly and indistinctly brown on dorsum. Hairs white, longer on sides of 1-3, a few black hairs dorsally on 2-7; 2 black lateral bristles on 1 and a clump of about 8 black bristles on posterior corner of 3. Venter gray pollinose, hairs white, long on 1-3 and apically on 7, 3 at the sides apically with a cluster of about 15 black bristles. Tubercles black, on 4-5 obtuse and subequal in length to antennal segment 2, acute on 6 and as long as antennae 1. Segment 8 thinly pollinose with white hairs. Terminalia black; hairs white, on surstyli dorsally and ventral margin apically black; fringe white basally and $2/3$ as long as antennae 1, becoming brownish and shorter apically.

Legs black, basal $3/4$ of tibiae yellowish red. Hairs white, at apex dorsally on femora and dorsally on tibiae black, all black on tarsi. Bristles black; claws black, base reddish; empodia and pulvilli brownish.

Halteres brown, stem lighter. Wings hyaline, veins brown, anterior cross-vein at $39/60$ length of discal cell, stump vein $1/3$ length of anterior crossvein, costa slightly dilated, subcostal cell light brown.

FEMALE. Length 16 mm. About 18 black bristles above in mystax, hairs on frons white except for 1 black hair, 2 bristles on ocellar tubercle black, hairs white. Central hairs on mesonotum white anteriorly, 5-6 slender black anterior dorsocentral bristles. Hypopleurals white, 1-2 black. Two black and 2 white scutellar bristles. Abdomen gray pollinose, dorsum 2-7 light brown; hairs white, longer on 1-2, a few black dorsally on 2-6 and many on 7. Venter gray pollinose, hairs white, erect on 1-5. Ovipositor black, 4.1 mm. long, $1/7$ as wide as long at the middle. Anterior crossvein at $30/45$ length of discal cell, stump vein $1/2$ length of anterior crossvein, costa not dilated, subcostal cell light brown.

HOLOTYPE. Male, Camp Baldy, Los Angeles County, California, 14 July 1950 (J. W. MacSwain), CIS.

ALLOTYPE. Female, 2 mi. N. of Warners Spring, San Diego County, California, 8 July 1956 (B. M. Bartosh), UCD.

PARATYPES. *California*: 1 ♂, Mission Gorge, San Diego County, 7 July 1962 (J. Powell), CIS; 1 ♀, Altadena, 16 August 1914 (F. R. Cole), CIS; 1 ♂, Pine Valley, San Diego County, 12 July 1953 (W. J. and J. W. Gertsch), AMNH; 1 ♀, Pinyon Flat, 23 August 1965 (J. Wilcox), JW; 1 ♀, Riverside, 10 August 1957 (E. I. Schlinger), UCD, 1 ♀, 9 September 1963 (M. E. Irwin), UCR; 1 ♀, Sentenec Canyon, San Diego County, 15 June 1954 (J. Powell), CIS.

The females placed here are uncertain; they all have a number of black bristles in the mystax and two or more scutellar bristles are black, however the anterior mesonotal and scutellar hairs vary from nearly all white to nearly all black. Another species could be involved. Females of *E. producta* (Hine) usually have the mystax and scutellar bristles all white, the anterior mesonotal hairs black and the scutellar hairs white; however, several specimens have from 3 to 8 black bristles in the mystax and one specimen from Arizona has many black bristles in the mystax and the two scutellar bristles are black. Final placement of these females will have to wait until more material, especially pairs, is collected.

Efferia spiniventris (Hine).

Erax spiniventris HINE, 1919, Ann. Entomol. Soc. Amer., vol. 12, p. 135. Type male, Santa Rita Mountains, Arizona, 5,000-8,000 feet, July (F. H. Snow), OSU.

Specimens from the following localities. *Arizona*: Baboquivari Mountains (F. H. Snow); 5 mi. S. of Carrizo, U. S. Highway 60, 12 August 1948 (J. Wilcox); Cerro Colorado Mountains, 24 June 1964 (Earl G. Davis); Cochise, 24 August 1935 (E. I. Beamer); Portal, 23, 24 July 1963 (M. A. Cazier, Art Raske, J. Wilcox); base Santa Rita Mountains, 4,000 feet, 22 June 1932 (D. K. Duncan). *New Mexico*: Silver City, 16 June 1934 (R. T. Kellogg).

MALE. Length 11 mm. Head black, whitish pollinose, hairs and bristles all white; face at antennae 23/31 width of one eye, vertex 18. Antennae black, whitish pollinose, hairs white, segments measure 9-5-9-21.

Anterior mesonotal hairs black, subequal in length to antennae 2, many white hairs on margins and humeri, no anterior dorsocentrals. Scutellum gray pollinose, 2 white marginal bristles, sparse white discal hairs subequal in length to antennae 1.

Abdomen black basally, reddish apically, grayish white pollinose, dorsum of 4-6 and 7 narrowly brownish pollinose; hairs white, longer on sides 1-5. Venter grayish white pollinose, narrow center of 3-7 bare, hairs white, long erect on 1 and base of 2; tubercles reddish, blunt on 4-5 and subequal in length to antennae 1, acute on 6 and 2 times as long as antennae 1. Sternite 8 with long white hairs apically. Terminalia reddish, hairs white with a few black on dorsum of surstyli basally; fringe white, at base 2 times as long as antennae 1 becoming subequal in length to antennae 1 at apex.

Wings hyaline, veins light brown, anterior crossvein at 22/37 length of discal cell, stump vein minute, costa slightly dilated, subcostal cell light brown.

FEMALE. Length 14 mm. Abdomen grayish white pollinose, dorsum 2-6 brownish pollinose, 7 bare black dorsally; hairs white short except on 1, a few black dorsally on 6-7. Venter grayish white pollinose, 3-6 narrowly at middle and 7 broadly bare, hairs short white except on 1 and base of 2. Ovipositor black, 2.8 mm. long, at middle 1/4 as wide as long.

***Efferia tuberculata* (Coquillett).**

Erax tuberculatus COQUILLETT, 1904, Jour. New York Entomol. Soc., vol. 12, p. 34. Type male, San Diego, Texas, April 30 (E. A. Schwarz), USNM.

Erax tuberculatus HINE, 1919, Ann. Entomol. Soc. Amer., vol. 12, p. 135. Description; reports from Davis Mountains, Texas (F. M. Gaige) and West Fork, Texas (J. E. Scherer), June.

Bromley (1934) reports from *Texas*: Bexar, Brewster, Brooks, Brown, Cameron, Dimmit, Hidalgo, Kleberg, Pecos, Starr, Tom Green, Travis, Webb, and Wilson counties, June 22–September 13.

Specimens are known from the following localities. *Arizona*: Douglas, 29 June 1962 (M. A. Cazier); Guadalupe Canyon, 27 mi. E. Douglas, 27 July 1963 (M. A. Cazier); 2 mi. NE. of Portal, 11 July 1962 (J. Wilcox). *New Mexico*: Alamogordo, 14 July 1936 (M. B. Jackson). *Oklahoma*: Cimarron County, 27 June, 3, 19 July 1933 (A. E. Pritchard); Texas County, 19 July 1933 (A. E. Pritchard). *Texas*: Breroster County, 24 June 1929; Hebbbronville, 19 August 1933; Hidalgo County, 9 August 1933 (S. W. Bromley), 14 August 1928 (L. D. Beamer); Lake Kemp, 29 June 1936 (M. B. Jackson); Pearsall, 13 August 1932 (S. E. McGregor), 14 August 1933; Uvalde, 6 August 1933.

MALE. Length 14 mm. Head white pollinose, hairs and bristles white, 8 below on either side of mystax and hairs on palpi mostly black. Face at antennae 29/38 width of one eye, vertex 20. Antennae black, hairs white, segments measure 10-5-10-26.

Black anterior mesonotal hairs subequal in length to antennae 2, hairs white on humeri and margins; bristles mostly white, 1 white anterior dorso-central. Scutellum grayish pollinose, 2 white marginal bristles, sparse erect white hairs subequal in length to antennae 1.

Abdomen grayish pollinose, dorsum of segments 2-6 brown pollinose broadly subshining; hairs white, longer on sides of 1-3. Venter gray pollinose, bare at middle of 3-6, hairs white, long on 1-3; tubercles black, pointed, subequal in length to antennae 1. Segment 8 shining black, hairs white, sternite produced and longer than 7 with an apical tuft of long white hairs. Terminalia black, hairs on sides and dorsum of surstyli black, otherwise white; fringe white, basally as long as antennae 1 becoming shorter apically.

Wings hyaline, veins brown, anterior crossvein at 33/47 length of discal cell, stump vein 1/4 length of anterior crossvein, costa slightly dilated, subcostal cell light brown.

FEMALE. Length 16 mm. Abdomen grayish pollinose, dorsum 2-6 brownish pollinose, 7 shining black except at sides basally; hairs white, longer on 1-2, a few short black hairs dorsally on 2-5, 6 with many and 7 all black haired. Venter gray pollinose, narrow center of 3-6 and 7 largely bare; hairs white, long erect on 1-3, 7 apically with black hairs. Ovipositor black, 3.8 mm. long, at middle 1/8 as wide as long.

Described from Oklahoma specimens. Specimens from Texas and Arizona may have a number of black bristles above in the mystax and the bristles on the ocellar tubercle black. One female from Texas measures 21 mm. in length, ovipositor 4.7 mm. long, at middle 1/8 as wide as long.

***Efferia tucsoni* Wilcox, new species.**

MALE. Length 13 mm. Head black, white pollinose, hairs and bristles white, on palpi largely black. Face at antennae 26/41 width of one eye, vertex 18. Antennae black, grayish pollinose, hairs white, segments measure 10-5-11-25.

Mesonotum black, grayish pollinose, central stripe brown and indistinctly divided, intermediate spots indistinctly brown. Anterior hairs black, anteriorly as long as antennae 2 becoming as long as antennae 1 at suture; humeri and margins white haired. Two black presutural bristles, 1 white and 1 black supraalar, 2 white postalar, 1 black and 2 weaker white posterior dorsocentral. Pleura and coxae grayish white pollinose, hairs and bristles white. Scutellum grayish white pollinose, hairs white as long as antennae 1, 4 white marginal bristles.

Abdomen black, grayish white pollinose, dorsum 2-6 brown and 7 narrowly at middle. Hairs white, longer on sides of 1-3; 4-5 white lateral bristles on 1. Venter grayish white pollinose, bare at middle of 6-7, hairs white, long erect on 1-2; tubercles on 4-5 blunt and shorter than antennae 1, on 6 acute reddish brown and subequal in length to antennae 1. Segment 8 grayish pollinose, hairs white, almost completely covered by 7. Terminalia reddish brown; hairs white, dorsum of surstyli basally with black hairs; fringe on lower forceps white, about as long as antennae 1.

Legs black, tibiae except tips yellowish red. Hairs white, dorsally on fore femora and tibiae and on all tarsi, black. Bristles black and white, on tarsi mostly black; claws black, base reddish; empodia and pulvilli light brown.

Knob of halteres yellowish, stem whitish, base brown. Wings hyaline, veins brown, anterior crossvein at $33/52$ length of discal cell, stump vein $1/2$ length of anterior crossvein, costa slightly dilated, subcostal cell light brown.

FEMALE. Length 15 mm. About 4 hairs and bristles on each side below in mystax black. Black anterior mesonotal hairs subequal in length to antennae 2. Abdominal segments 1-6 and 7 laterally, gray pollinose, 7 mostly shining reddish brown; hairs short white, longer on 1-2, short black dorsally on 6-7. Venter grayish pollinose, 6 narrowly at middle and 7 largely bare, hairs short white, erect on 1 and basally on 2. Ovipositor black, basal $1/6$ reddish, 3.6 mm. long, at middle $1/7$ as wide as long, narrowed at basal $1/3$.

HOLOTYPE. Male, Portal, Arizona, 23 July 1963 (M. A. Cazier), CAS.

ALLOTYPE. Female, same data, 24 July 1963 (J. Wilcox).

PARATYPES. *Arizona:* 1 ♂, 4 ♀♀, Alamo Canyon, Ajo Mountains, 24 July (H. B. Leech, J. W. Green), CAS; 1 ♂, Baboquivari Mountains (F. H. Snow), JW; 1 ♂, Baboquivari Canyon, W. side Baboquivari Mountains, Pima County, 25-27 July 1952 (H. B. Leech, J. W. Green), CAS; 1 ♂, Benson, June (D. K. Duncan), 1 ♀, 2 June 1933 (Owen Bryant), JW; 1 ♂, Bisbee, 10 June 1933 (R. H. Beamer), JW; 1 ♂, Canyon Lake, 21 August 1933 (F. H. Parker) 48, JW; 1 ♀, Congress Junction, 28 July 1933 (J. D. Beamer), JW; 2 ♂♂, 1 ♀, Portal, 12 June 1964 (Jean Puckle, M. A. Mortenson, M. Cazier), ASU, 1 ♂, 3 ♀♀, 23, 24 July 1963 (M. A. Cazier, J. Wilcox), ASU, 1 ♀, 14 June 1959 (L. A. Stange), UCD, 3 pairs, 1 ♂, 4 ♀♀, 1 mi. W., 12, 13, 14 July 1964 (Jean Puckle, M. A. Mortenson, M. Cazier), ASU, 1 ♂, 3 ♀♀, 2 mi. NE., 10, 11 July 1962 (J. Wilcox), JW, 1 pair, 26 June 1964 (Jean Puckle, M. A. Mortenson, M. Cazier), ASU; 1 ♂, Santa Catalina Mountains, 20 June 1933 (Owen Bryant) 276, CAS, 3 ♂♂, 30 June 1933 (Owen Bryant), JW; 1 ♀, Sierra Ancha Mountains, June (D. K. Duncan), JW; 7 ♂♂, Tucson, 20 June, 15 July, 1 August 1937, 8 July 1939 (Owen Bryant), 1 ♀, 9 August 1928 (A. A. Nichol) at lights, 1 ♀, 8 mi. N., 21 July 1962 (Earl G. Davis),

JW: 1 ♂, Wittman, 2 July 1937 (C. C. Deonier), JW. *California*: 2 ♂♂, Antelope Springs, Inyo County, 17 July 1953, 24 August 1960 (E. Jessen, J. W. MacSwain), CIS; 1 ♀, 25 mi. S. Ivanpah, San Bernardino County, 13 October 1958 (J. A. Chemsak) *Chrysothamnus*, CIS. *New Mexico*: 1 ♂, 6 mi. W. of Animas, 27 July 1963 (J. Wilcox), JW; 1 ♂, Luna County, 14 July 1934 (R. T. Kellogg), JW; 1 ♂, Red Rock, 24 July 1932 (R. T. Kellogg).

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